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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE in that the size of the page has been reduced from 9 in. x 12 in. to 8½ in. x 11½ in. The type area of the page remains the same, namely, 7 in. x 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:

Mondays to Fridays 9.30 a.m. till 5.30 p.m.

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Reductions in Cheap Fares

SPEEDY confirmation has been forthcoming of the surmise in our issue last week that reports of an impending curtailment in cheap travel facilities were well based. As will be seen by the details given at page 257, the Minister of War Transport has announced numerous restrictions, applying mainly to cheap day trips, visits to evacuees, and travel by evacuated Civil Servants, and members of the Forces on short leave. Green Line coaches are to be withdrawn. Obviously the movement of men, materials, and munitions during the coming winter will present the largest transport problem since the war began, and the Government has been forced to the decision that it could be solved only by imposing new restrictions on travel. Need for the steps which are now to be taken arises not only from the additional burdens which transport must bear, but also from the loss of carrying capacity caused by the longer blackout hours, by winter conditions, and by the urgent need to save liquid fuel and rubber. On the passenger side, in the last twelve months military traffic on the railways has shown a very heavy increase. Thousands of special trains are being run every month and travel by service personnel on ordinary trains has grown, and is still growing, as the Forces expand. It now amounts to two-thirds of the long-distance passenger traffic. It is estimated that the increase in military and industrial traffic will necessitate the running every day of at least 250 more trains than were run last winter, and these will have to be superimposed on the arrangements for working 1,000 extra trains every day which have already been put on for the transport of industrial war workers.

Increasing Railway Capacity

To enable the railways to deal efficiently with the vastly increased volume of traffic which it has been realised they would have to carry during the coming winter, schemes for increasing the capacity of the lines have been and are still being pushed forward as rapidly as possible. In some cases bottlenecks have occurred or have been accentuated by the growth of munition traffic and by the diversion of traffic on lines not designed for it. One section, which carried little or no coal before the war, now moves 4,000,000 tons a year, necessitating the use of 160 trains a week. This is one of a number of sections on which the line is being quadrupled. A scheme for quadrupling the line on another section was estimated to take thirty months, but in fact it has been completed in twelve months. The wartime railway improvement programme contains nearly 700 schemes estimated to cost £7,750,000. About two-thirds of these have been completed and it is hoped to bring into use most of the other works before the winter. Track capacity for war traffic already has been increased by curtailing passenger train services, and it is clear that as the number of passenger miles has risen since the war by more than 50 per cent, whereas passenger train miles are down by over 25 per cent, trains are now carrying on the average twice the load moved in peacetime. The restrictions shortly to be put into force are not considered likely, by themselves, to reduce the demand for passenger services to a volume which can be accommodated, unless the public co-operates in voluntarily reducing its calls on transport.

Travel by Permit

The Ministry is known to have examined the possibility of introducing a travel permit system and to have based its rejection on three grounds; namely, the complexity of such a system, the claims it would make on manpower, and the inconvenience it would cause to those who have to travel on necessary business. At the same time, it is made clear that a further extension of restrictions on passenger travel may be necessary unless there is far greater co-operation than hitherto on the part of the public in economising in the use of transport. It would appear that already in fact the Ministry has taken the first steps towards a system of travel rationing by reducing the number of occasions on which voucher travel is granted members of the Forces, evacuated Civil Servants, and so forth. There would not seem to be any insuperable difficulty in a system under which everyone would be permitted, say, four journeys a year, and, as has been previously suggested in our columns, coupons from the general ration book would be used in respect of these services. Those whose business required them to travel more often could be accorded additional coupons in much the same way as those who have to use a motor car for essential national needs are given petrol coupons to meet their requirements. Season ticket holders and those using workman's tickets would not be affected. The coupons would be surrendered at the booking office and would be in respect of journeys, not mileage, which would help to simplify matters. Moreover, by centralising the machinery for dealing with applications for coupons in excess of the basic ration the organisation required to cope with the innovation could be kept to a minimum.

Making Up Lost Time

Records that we have made while travelling during recent months show that drivers of express passenger trains on most main lines are doing their utmost to recover time lost by circumstances not under their own control, and often with remarkable results from the performance point of view. For example, on a recent L.M.S.R. journey on the 1 p.m. express from Euston to Glasgow, the driver of one of the double chimney Pacifics, with a 17-coach load of 560 tons gross, on a run which had been delayed in its earlier stages, regained 14½ min. from Lancaster to Carlisle alone; a particularly notable achievement was the time of 40 min. 7 sec. with this load for the 31.5 miles from Carnforth up to Shap Summit, which alone was a cut of 8 min. on schedule. On the L.N.E.R., Pacifics of the "A4," "A3," and even "A1" classes have been gaining time from Grantham to Kings Cross with 20-coach loads weighing, with their crowded passenger traffic, 630 tons tare and fully 700 tons gross; one of the double chimney Pacifics with 19 coaches weighing 665 tons gross from Grantham, and 18 of 640 gross tons from Peterborough, regained 9½ min. to London, notwithstanding a loss of 1½ min. by signals. The G.W.R. is in no way behind, as is witnessed by a journey from Swindon to Paddington, on which a "Castle" 4-6-0 with 520 tons tare and 575 tons gross regained 20 min., making the run of 77.3 miles in 80 min. 27 sec., or 80 min. net. Many Southern runs might be quoted in the same connection, particularly with the new "Merchant Navy" class Pacifics, which are now doing notable work west of Salisbury. In this way engine-crews are making their own valuable contribution to the war effort by doing their utmost to keep their trains to allotted timetable paths.

Rail Steel Characteristics

It is surprising for how long a theory will continue to be held, and often tenaciously held, even in the technical realm, when subsequent developments have knocked away all the props of evidence by which it may have been supported. One such theory has found expression once again in a recently-published book on steel; it is that railway rails made of Bessemer acid steel show better wearing properties, and therefore have a longer expectation of life, than those manufactured from open-hearth steel. The facts are that in the early years of steelmaking the Bessemer acid process was used exclusively for rail manufacture, and it was not until the war of 1914-1919 that the almost complete turnover to open-hearth steel took place. There are many valid explanations of the exceptional behaviour of the early Bessemer rails, quite apart from the process by which the steel was made, and chief among them the relatively light loads that they had to carry, permitting them to acquire a tough work-hardened skin on the running surface which has stood them in good stead in later years. Then, when open-hearth steel came into use for rails, it took many years before the British Standard Specification of 1922 recognised that open-hearth basic rails required 0.10 per cent. more carbon than Bessemer acid rails to display roughly the same physical characteristics, and during the intervening period much of the open-hearth basic product was prejudiced by being held down to the Bessemer carbon limits, and becoming therefore too soft. When the 1922 specification was introduced, it contained what has been proved to be a material error in its arbitrary limitation of manganese, by which once again the open-hearth rail suffered in comparison with the early Bessemer rails. Now that this error has been corrected, and manganese restored to its proper status, there is no evidence that in present conditions the Bessemer-acid rail enjoys any material wearing superiority over its open-hearth basic counterpart. The book on steel referred to above is reviewed on p. 244.

Accelerating American Abandonments

The course of railway abandonments in the United States, which showed some signs of slackening during last year, once again is accelerating. As is mentioned in our Overseas Railway Affairs columns on p. 248, railway applications to the Interstate Commerce Commission for permission to close down unremunerative lines have increased, in the first five months of 1942, to 75, covering a total of 1,055 miles, as compared with 739 miles in the corresponding period of 1941. Some of the latest applications, also, relate to considerable mileages; the Atchison, Topeka & Santa Fe Railway system, for example, alone has simultaneous applications before the I.C.C. relating to no less than 330 miles of line; the Union Pacific Railroad is seeking to abandon a 60-mile stretch; and the plea of the Southern Pacific to close down the 121-mile line in Utah between Lucin and Corinne Junction—a historic section which formed a part of the

first through route to the Pacific coast—has just been granted. Judgment on these applications is a matter of considerable difficulty. On the one hand, utilisation of locomotives, rolling stock, and staff in working and maintaining inadequately patronised lines cannot be justified at these times of acute shortage elsewhere, and the rails and other track materials, when recovered, can for the same reason be found immediate use in other parts of the country where they are badly needed. On the other hand, the acute shortage of rubber is curtailing road operation so much that certain areas of country may be cut off entirely, if their railway communications are withdrawn. The matter is further complicated by a recent judgment of the Supreme Court to the effect that the conditions on which the I.C.C. authorises abandonment may include compulsory compensation by the railway concerned of the displaced labour.

Passenger Train Loading

In the peacetime operation of main-line passenger trains, it was fairly simple to arrive at an estimate of the addition to be made to the tare weight of the rolling stock in order to cover the weight of passengers and luggage, and so to arrive at the gross load. It was generally accepted that 5 per cent. of the tare load of an express of normal formation, with restaurant cars, represented an average passenger loading, and 7½ per cent. a full train, with practically all the seating occupied. War travel conditions, however, with the withdrawal of restaurant cars, and the reversion to four-a-side seating in third class compartments, have had a considerable effect on this relation between tare and gross loads. For example, a scrutiny of the 1 p.m. express from Euston to Glasgow, when made up recently on a Monday to 17 bogie vehicles, showed that it had 740 third class and 72 first class seats—a total of 812 passengers—in a tare weight of 499 tons. Beyond Crewe, with every seat in the train occupied and about 40 passengers standing, there were 850 passengers, and at the usual reckoning of 16 persons of average weight to the ton, the passenger weight was 53 tons. Adding to this the passengers' hand luggage (largely the full kits of Service men), and the contents of one large brake, it may be reckoned that the total weight of passengers and luggage was fully 60 tons or so, bringing the gross weight of the train to 560 tons. The addition thus to be made to the tare was no less than 12 per cent., and was equal to the weight of two additional coaches. There is little doubt that some of the 20-coach express trains frequently run on the L.N.E.R., with tare weights of 630 to 640 tons, must impose gross loads of 700 tons and over on the locomotives.

Surface Finish

The degree of finish given to the machined surfaces of the various parts of any piece of engineering equipment has become a matter of considerable importance in recent years. This is a direct consequence of the growing recognition of the fact that, apart from questions of friction of rubbing surfaces, the degree of finish has an important influence on the incidence of corrosion, while it also affects the efficiency of shrink and press fits. It is of interest to note, therefore, that the Institution of Production Engineers has recently issued a report entitled "Surface Finish" (Price 15s.) giving a detailed account of an investigation undertaken by its research department into the various problems associated with the question of surface finish. The investigation covers the products of the main British engineering industries, in the course of which hundreds of different grades of finish have been dealt with, and it is possible for the designer to indicate on his drawings not only the class of finish required, but the measurements required to test if the specified finish has been obtained. An account is also given of an American investigation of the subject.

Intensive German Wagon User

During the past few weeks the Reichsbahn has been conducting an intensive press campaign with the objective of saving wagon space and speeding up loading and unloading operations. Slogans such as "Every additional wagon provides another tank for the front" and "Every additional wagon provides another 600,000 rounds of machine gun ammunition" conclude with direct appeals to the public not to use trains for anything but essential travel, and the workers to load wagons on Sundays as well as weekdays. State Secretary Albert Ganzenmüller, of the German Ministry of Transport, and Herr Görllitzer, the Deputy Gauleiter of Berlin, recently addressed a special appeal to railway workers saying that now was the time to demonstrate comradeship by mutual assistance in the fulfilment of difficult tasks. On June 30 representatives of all transport services, and of industry, met in Berlin to decide jointly on the best methods of accelerating the turn-round of wagons.

Regional Transport Officers have been empowered to allocate wagon space according to the urgency of delivery for various kinds of goods. In addition, as we have already recorded, the Minister of Transport issued a Decree to secure the maximum use of available railway wagon capacity by which, from June 30, Reichsbahn goods wagons may be loaded up to two tons (heretofore one ton) over the scheduled carrying capacity for inland traffic. Belgian and French wagons used on Reichsbahn lines, may now carry one ton above their scheduled capacity.

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What Constitutes the Block Section?

In a recent discussion on the interesting question of what was the correct definition of a block telegraph section, the view was strongly expressed that it was the length of line from the last stop signal of a signal box to a point 440 yd. beyond the first stop signal at the next one. This appears at first sight to be a very satisfactory definition and is indeed frequently met with in books on signalling and traffic working, nevertheless there seem good reasons for considering it to be not strictly correct. There are occasions when a signalman is allowed to accept a train with the line clear to his home signal only and the title of the regulation which authorises this course is "section clear, but station or junction blocked." This plainly implies that the block section ends at the first stop signal, for otherwise it could not fairly be said to be clear with an obstruction just in advance of it. The 440 yd. overlap, which has to be unoccupied before a train can be accepted in the more usual way, must according to this wording, be part not of the section but of something else—the "station" or "junction"—covered by the expression "station limits." This amounts to saying that the block section ends at the first stop signal, but that some additional space, forming part of station limits—or of the next section where there is only one stop signal—must usually be clear before a train is accepted. This appears to be the scientific way of looking at the matter and one that leads easily to an understanding of what a "section" is under automatic signalling.

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Alloy Steel for Locomotives

Mr. C. B. Bryant, Engineer of Tests, Southern Railway, U.S.A., recently had some interesting notes to say on the subject of alloy steels and their use in locomotive construction. He was writing in the pages of our American contemporary, *Railway Age*, and said that American railways have not hitherto been large users of alloy steel forgings, but a considerable number of locomotives are now operating in which certain alloy steels are employed. With the gradual and now virtually complete disappearance of alloys from railway uses, together with the necessity for sharply reducing the use of manganese, the problem of maintaining these alloy-steel locomotives has become acute and difficult. The substitution of carbon steel for nickel-alloy boiler plates in locomotives designed for the latter necessitates reduction in working pressures, increased weight, or both, with consequent reduced transportation efficiency. Locomotives designed with lightweight alloy steel reciprocating parts require extensive rebuilding when heavier carbon-steel parts of equivalent strength are substituted. In such cases restrictions in maximum permissible speeds are necessary, and intensive studies are being made to discover the possible substitution of quenched and tempered carbon-steel forgings for alloy steel. The preliminary experience of those railways which are facing this problem indicates that the reduced efficiency and capacity of the locomotives may not be as serious as was at first feared.

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Locomotive Fuel in Japan

The recent trend of war events in the East has led many to suppose that a considerable amelioration of Japan's fuel position would result, and there is no doubt that this is so, so far as liquid fuels are concerned. Yet little change can be expected in the locomotive fuel situation. Compared with the number of steam locomotives, oil- and petrol-engined vehicles are not numerous in Japan, although including the stock of the small private lines there must be some hundreds of these railcars and locomotives at work. On the Japanese Government Railways the locomotive coal consumption has been of the order of 3,000,000 tons a year, and of this total about 45 per cent. came from the Kyushu region, 25 per cent. from the island of Hokkaido, 16 per cent. from Joban, about 6 per cent. from Fushun (in Manchukuo), and small quantities from China and from the island of Karafuto, shared with the U.S.S.R. All the indigenous Japanese coals are of a low-grade bituminous or semi-bituminous type, and have a high ash content, varying from 11 per cent. in the Hokkaido coal to 23 per cent. in the Yamaguchi coal. On the other hand, the coal from Manchukuo has only 6½ per cent. of ash and that from Karafuto 9 per cent. From 4 to 5 per cent. of the total coal consumption is in the form of briquettes.

Private-Owners' Wagons—Past, Present, and Future

AMONG several very interesting features of the current issue of our contemporary *The Railway Magazine*, is an illustrated article dealing with private-owners' wagons. The extensive use of these wagons for mineral transport is peculiar to Great Britain and the reason for this is to be found historically in the circumstances in which the railway systems and coal mining developed in this country. At their inception the railway companies were not required by statute to supply wagons for coal class traffic and subsequently, with the development of the mining industry, the companies and the other interests concerned were unwilling to make the radical change under which the railways would have been required to provide adequate wagon service and the traders compelled to rely on the service so provided.

Even today the railways, generally, are not under any statutory obligation to supply wagons for coal class traffic except in Scotland and on the north-eastern section of the L.N.E.R. In practice, however, the railways did, in fact, in pre-war days, supply a proportion of the wagons required in certain districts and, in the recently developed Kent coalfield, the Southern Railway supplied all the wagons. As the result of the railways' general adherence to their statutory position, and the small scale on which mining operations originally developed, the majority of private owners could neither build nor repair their wagons, a position which resulted in the development of wagon building and repairing companies. In many cases also, mineral producing concerns were unable to raise the necessary finance for the purchase of wagons, and this led to the growth of wagon finance companies or wagon hiring companies, entailing the provision and service of capital and management entirely unconnected with the railways, the producer, or the consignee. With this early and piece-meal development of the coal industry there has also grown up a multitude of factors, merchants, and traders, and it cannot be gainsaid that, pre-war, the great diversity of ownership increased the actual cost of transport in consequence of the extra shunting, managerial, and overhead expenses involved.

It is also well to remember that, subject to the statutory exceptions mentioned above, coal rates are charged on an owner's wagon basis and if the railway companies supply the wagons a wagon-hire charge has to be paid in addition. The rates charged, however, include the service of returning the wagons after conveyance to the particular pits from which they were originally forwarded, and this has proved to be a very onerous task. Before the war this burden was gradually being mitigated by colliery amalgamations and the consequent pooling of wagons but, nevertheless, the shunting operations incidental to sorting empty wagons for return to particular areas or collieries, and the empty haulage back to the forwarding points, represented a task of considerable magnitude and operating cost. On the outbreak of war in 1939, the Minister of Transport requisitioned all private-owners' wagons, subject to certain minor exceptions, with the result that about 570,000 wagons out of a total of about 600,000 wagons were taken over by the railways acting on behalf of the Government. Wagon owners were, of course, entitled to compensation for the requisitioning of their wagons and this was fixed by the Government on a weekly basis which takes account of the capital costs, capacity, and age of the wagons. The object of the requisitioning order was to increase the usefulness of the available wagon resources of the country, both railway-owned and privately-owned; to reduce empty and cross haulage, and minimise shunting operations by utilising the wagons for general use, irrespective of previous ownership, labelling, or location. A further practical advantage is that it has been possible to use about 100,000 private-owners' wagons weekly without detriment to the coal trade for back-loading suitable traffics, instead of the wagons being hauled empty direct to the collieries. The whole of the privately-owned and railway-owned wagons are now operated in common by the railways' central wagon control and, as shown on page 202 of our August 28 issue, very substantial savings have been effected in uneconomic empty-wagon mileage, although it is not possible to allocate these economies between requisitioned and railway-owned wagons respectively.

The pooling of privately-owned wagons with railway wagons has yielded such substantial advantages that the desirability of their permanent acquisition by the railways, the Government, or some central authority will almost inevitably be revived after the war. The Standing Committee on Mineral Transport considered this proposal in 1929, but, although agreeing that the present system was defective, expressed the view that, although the railways might eventually take over the ownership and running of all mineral wagons to the benefit of the community, assuming the necessary finance could be provided, such a step was then neither advisable nor practicable. A census taken by

the committee showed that there were then not less than 5,000 separate owners of mineral wagons and, in 1929, it was estimated that the capital value of the privately-owned wagons in the coal trade alone was £44,000,000, to which must be added the value of a substantial number of other privately-owned mineral wagons. Thus, any proposal for their purchase would first necessitate the provision of a substantial capital sum and also interference with a complicated and extensive system of wagon finance, building, hire, and repair. It is clear, however, that the national post-war position will require transport to be placed on the most economic basis possible in order to assist the rehabilitation of our overseas trade and this may well necessitate consideration being given to the desirability of effecting radical alterations in pre-war transport practices in many directions.

Long Alpine Railway Tunnels

THE article* on page 249 of this issue calls to mind certain points in the history of long railway tunnels constructed under the Alps during the past 75 years. The first of these outstanding engineering works was the Mont Cenis tunnel, 8 miles in length, begun in 1857 and completed in 1870. This great pioneer undertaking proved to be a striking example of the effect of power drilling, as opposed to earlier hand methods, and its effect on rate of progress. Between 1857 and 1861 hand drills only were available, and the average rate of progress per working face per week was only 12 ft. during this period. In the latter year power drilling, though still somewhat primitive, was introduced, and as a result the average progress during the remaining nine years the work was in hand proved to be 32 ft. face a week. This tunnel with its 530 sq. ft. of cross sectional area is one of the largest of the really long tunnels; no electric lighting was then available and the methods of ventilation were primitive.

The next important tunnel to be undertaken was the St. Gotthard, 9½ miles in length, begun in 1872 and completed in 1880. Despite greater difficulties arising from water under high pressure, disease due to inadequate ventilation, rock dust, and other causes, progress on this work was considerably better than

in the Mont Cenis. The Arlberg tunnel constructed between 1880 and 1883 was completed even more expeditiously. The longest railway tunnel in the world, the Simplon, was begun in 1898 and opened for traffic in 1906. It is 12¼ miles long, and very serious difficulties were encountered by the construction engineers. Actually, there are two parallel tunnels, the first of which was driven to full section of 250 sq. ft., and the other smaller, but subsequently enlarged to the same area for the second track. Very heavy discharges from springs in the gneiss, mica schist, and limestone through which the headings had to be driven, held up work for six months in one instance, and in another, where the temperature of the spring was 114° F., cold water had to be pumped into the working to reduce the temperature. Heavy timbering was also needed in places to support the mica schist which disintegrated under the action of the water. In the centre of the tunnel temperatures up to 133° F. had to be combated with the aid of cold-water sprays.

Some of the more important improvements effected in this work were connected with improved ventilation and drainage. Forced-draught ventilation systems were installed at each end of the tunnel and both ventilation and drainage were greatly facilitated by the use of cross connections with the smaller tunnel, through which the air and water were led. Also, only compressed-air locomotives were allowed to work within 2 km. of each heading, with great benefit to the atmosphere in the workings; steam locomotives were used from that point to each portal. As a result, remarkable progress was made; the average was 96 ft. each face a week. Because of the difficulties encountered and overcome this rate of progress is particularly remarkable and compares very favourably with tunnels constructed with all the latest equipment 30 years later. The most recently constructed Alpine tunnel is the Loetschberg, 9 miles long. Work on it had proceeded for some time when the greatest obstacle of all was met. Some 600 ft. above the working face ran a river, in the bed of which was a gravel-filled crevice extending to the level of the tunnel; when the heading reached this crevice it was flooded with the discharge of the river above. So serious was the position that it was decided to block up the tunnel with a bulkhead to exclude the water, and realign the tunnel, making a detour to avoid this formidable obstacle. These great tunnels are fitting monuments to the skill and perseverance of the Swiss, Italian, and French engineers, and mainly to Italian labour.

* Developments in Tunnelling Methods

Publications Received

Steels for the User. By R. T. Rolfe. Second Edition. London: Chapman & Hall Limited, 11, Henrietta Street, W.C.2. 8½ in. x 5½ in. x 1 in. 356 pp. Illustrated. Price 25s. net.—It is a tribute to the excellence of this handbook that a second edition should have been called for within four years of the publication of the first. The present edition represents a considerable enlargement of the work, which in course of revision and expansion has grown from 280 to 356 pages and has gained 31 more illustrations. An important chapter has been added on weld testing and treatment; there is much additional matter concerning the heat treatment of steel, fatigue testing, and general principles governing the selection of steel for specific purposes; other new matter fills certain gaps in the first edition to which attention had been called by reviewers. The "user" could hardly have a more compact and well-informed guide than is embodied in this volume, with its simple explanations of complex principles and processes governing the mechanical quality of steel and the effect on it of composition, bright and free-cutting steels, industrial heat treatment of low and high carbon steels, case-hardening, the use of steels at elevated temperatures, and various types of testing; and in war conditions the number of users of steel requiring to have some mastery of this knowledge is, of course, greatly increased. One addition that we notice in the new volume is the author's contention that the exclusion of basic Bessemer steel from British Standard Specifications, due to the poor reputation earned by this class of steel in early days, when it was badly made from unsuitable Cleveland ores, was

a mistake; the recent revival of basic Bessemer steel production at Corby works in Northamptonshire has proved (were such proof needed) that a perfectly reliable basic Bessemer steel can be made, and that this exclusion has unjustifiably hampered British manufacturers in competing with Continental rivals. This statement is undoubtedly correct; but another in the same chapter to the effect that Bessemer acid steel rails have shown a marked superiority in wear over open-hearth rails, has little or no evidence to support it, and certainly will not command general acceptance. A reference to this matter of rail steel characteristics and dubiously-founded reputations is made in an editorial note on page 242.

Gas Producers for Motor Vehicles and their Operation with Forest Fuels.

By I. Kissin. Imperial Forestry Bureau Technical Communication No. 1. Oxford: Imperial Forestry Bureau, 39, Museum Road. 9½ in. x 7½ in. 37 pp. Illustrated. Paper covers. Price 3s. net.—Although the number of users of charcoal for Gas Producers is very limited in this country, the Technical Communication No. 1, issued by the Imperial Forestry Bureau, serves a useful purpose in bringing together most of the information available on this subject and should prove a useful reference communication for the Dominions overseas. The theory of producer gas is treated in its simplest form and only general information is given as to various makes and types of producers; nevertheless, the reader is able to obtain a clear insight into the essential features of each type of equipment, and for further information should refer to the 75 publications given at the end of the communication.

There are several debatable points discussed such as, for example, the suggestion to use higher compression ratios up to 8-to-1 to recover loss of engine power. Many users have in fact found that such an increase in compression ratios causes mechanical damage to the engine if petrol is used—even for starting up the producer. Some interesting figures are given for the comparative costs of operating on producer gas which show that, taking into account loss of power and reduction of pay load, weekly mileages of between 260 and 280 must be run before producer gas can show economical advantage as compared with petrol at 2s. a gallon. The publication is illustrated with diagrams and photographs showing types of equipment used and their location on the vehicle. In any future issue of this publication additional diagrams and photographs of other components such as mixing valves, cleaning and cooling units would give the reader a more nearly complete picture of modern producer-gas equipment.

Revista de Formacion y Documentacion Profesional. Review of Professional Formation and Documentation. Plaza de Santa Barbara, 10, Madrid. 104 pages. Annual subscription 80 pesetas.—The publication of this journal, in Spanish, has now been resumed, after a period of suspense. It appears as the Official Bulletin of the General Direction of Technical & Professional Education in Madrid, and contains, apart from several articles of technical interest, reviews of scientific works and a bibliography of recent literature. The journal is obviously designed with the commendable object of keeping the technical schools in Spain in touch with international scientific progress.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Railway Charges and Facilities

London,
August 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Mr. W. B. Thompson's arguments in support of the unspecified criticisms of the railways by Mr. Courtauld are far from accurate, even though they date back to the spacious Victorian days or to 40 years or so ago, when a member of Mr. Courtauld's family visited Mr. Thompson. They remind me of the best British "bull" I have heard—"Far away fields look green, but on closer inspection they present a less roseate appearance."

It is a peculiar distortion of the Railways Act, 1921, to say that freight rates must by it be fixed to give the railways a standard revenue and to suggest that rates are no longer limited by what the traffic will bear. The latter principle still stands but there was superimposed by the Act new limitations of rates and of profits unknown in the Victorian era. The innuendo that British trade by reason of the Act of 1921 or anything else has been crippled by railway rates is as incorrect as the statement that the railways must charge enough to enable them to pay as much as the trade unions choose to demand. Those who have followed the railway history of the last 20 years know that the claims of the unions have not always been met and that the general level of railway wages has been determined by tribunals and wages boards. They also know that the increase in the cost of railway wages and in railway purchases of coal and materials generally, during and since the last war, has not been passed on in full in railway charges but has largely been met by railway owners.

One can appreciate Mr. Thompson's sense of equity as to the difficulties of the railway owners in the past 20 years by his dictum that the Act of 1933 was passed to make it as difficult as possible for traders to use alternative means of transport. No trader in the country, Courtauld or any other, is under the disabilities of the railways *vis-à-vis* its competitors and as to the conduct of its own affairs.

Then we are told, after a reference to 1d. a mile fares 40 years ago, that a fare of 1s. for 7 miles is prohibitive, but Mr. Thompson, 40 years on, does not apparently remember that the purchasing power of the 1d. has altered since then and that 7d. in 1902 purchased more than does 1s. now. Perhaps, however, he does know this, but considers that, because railway owners are restricted to the level of profits earned in 1913 without adjustment for new values of money, they should be further liable to bear the increased cost of their wages and materials and sell travel on the assumption that a penny is now worth what it was 40 years ago.

The statement that long journeys now are the privilege of the rich can only mean that the huge number of persons who have been pouring into London in the last few weeks from many miles away are privileged to be rich, because they could afford to pay a little under 1½d. a mile, and this at a time when the cost of living is double that of 1914 and more than double that of 1902.

We are asked to think of local services in London which have disappeared and the joys of travelling from Fenchurch Street to Blackwall to join an ocean ship—gone, alas, like a summer's day. But we are not asked to think of the new local railway services since 1902, not provided by those who consider railways as anathema but by the railway companies. We are not even asked to think of the joys of travelling to Tilbury instead of Blackwall and the reasons for the change. The same type of comment is made on long-distance trains. I have not attempted to check his researches into the past, because clearly he has omitted to refer to the present where it is better than the past. Restaurant cars were never, we are told, taken seriously by the railways and provision was not made for more than a fraction of the passengers carried. A "fraction," like a lump of stone, may mean anything, but, in fact, the provision of cars was in accordance with the demand, and the services provided were more fully used than in any other country in the world and at much cheaper prices than the American cars mentioned, despite the heavy losses in running the latter. The satisfaction of thirst was provided for without charge whether a meal was taken or not, provided water was the medium required.

As to steamers, I think I have travelled on or seen most of the railway steamers built in the last 60 years, and the great improvements since then in the English Channel, the Irish Sea and the east coast, even in the last 20 years, are obvious to

anyone who really compares past and present. It will be a great pleasure to Mr. Thompson to know that one steam vessel which was running in 1939 is an 80-year-old survivor from the spacious Victorian era.

Then we read the amazing statement that there is only one fast British business train for which no excess fare is (or was) charged. I doubt if more than one individual in Great Britain thinks this.

Whether carriages of the corridor type, with end doors only, are the most suitable for long-distance trains is, of course, a matter of opinion, and no doubt some prefer carriages of the Victorian type just as some, for like reasons, object to bedrooms equipped with running water, but in each case these lovers of the past, because it is the past, are luckily few.

We are told that overcrowding was habitual on British trains between 1918 and 1939, and I can only assume that Mr. Thompson's journeys by train were as few as "angels' visits," as his experience of no journey without disgraceful overcrowding and passengers standing in corridors is peculiar.

He seems to think that long trains were run crammed from end to end so as to reduce mileage, and made an enormous profit. Longer trains hauled by more powerful engines were, of course, run than in the Victorian era in order to meet public needs, and improved the comfort of passengers including greatly increased arrangements for meals and light refreshments, but there were also more trains. In 1913 the four main-line systems ran 236 million passenger-train miles and in the period of depression in 1938 the number was 285 millions. Can he really think that there are enormous profits from passengers with an average fare of 0.7d. per mile?

Yours faithfully,
GILBOIS

Post-War Planning and Transport

25, Victoria Street, London, S.W.1.

August 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The letters that have appeared in your columns regarding post-war planning, and particularly planning which will have international repercussions, open up problems of deep interest. Mr. Ashley Brown is right in emphasising that one danger ahead is that we shall accept vast and possibly unwieldy organisations, believing that they represent scientific planning, whereas, in fact, they are simply forced on us by events.

Planning is essentially a scientific conception. When men talk in an easy way about a revolution in post-war transport, one wonders if they are aware how little real science there is in the realm of politics. Indeed, it is significant that, to the present, no science of politics has commanded anything like universal acceptance. The truth would seem to be that one can take part in politics; one can enjoy politics, but one cannot, in any real sense, *know* politics. One may have a flair for politics, but a "scent" is not the word scientific analysis would choose to indicate real understanding. And may it not be that this is what we should expect? Politics is the art of managing men and women in the mass and reaches its ends by a process of trial and error, this being the accepted method of artistry.

When this war ends railway stockholders hope that a very much larger element of order will be introduced into their industry. There has been a great wastage in the past, and the dividends of stockholders have suffered. In some cases the security of the capital came into existence in its present form less than a quarter of a century ago. But a much larger element of order and the elimination of waste are not what would-be reformers seem to have in mind when they write of "revolutions" in transport and similar public services. *The Economist* of August 1, 1942, enunciated a deep truth when it said that organising for full production should properly mean, "not impeding production." The writer went on to say that, after the war, prosperity will still depend on the skill of workers, the enterprise of traders, and the courage of investors.

Private enterprise would seem to be the peculiar bug-bear of the theoretical world planner. Is this because he is, by hypothesis, a handler of words, and seldom an executant with practical experience in the worlds of commerce and industry. Yet these exist for men and women and not on their own account. "Move, but move warily," should be the order of the day in all post-war reconstruction. While progress by trial and error is the law in human relations, perfection will not easily be reached. Certainly, it will not be found in an economic state where lenders are expected to lend but borrowers need not repay, an implication which lies behind much post-war planning, which has its origin in proposed extensions of the Lease and Lend principle.

Yours faithfully,

ERNEST SHORT,
General Secretary
The British Railway Stockholders Union Limited

The Scrap Heap

MAKING GOOD USE OF THEIR TIME

Institute of Transport examinations have been held in Oflag VIB and Stalag XXA and it is hoped that the results soon will be announced. There are several members of the institute in Oflag VIB, and they have formed themselves into a study group which works under the aegis of the camp educational faculty; the institute has arranged for correspondence courses and books to be sent to some of the students with whom it has been in touch.

The current issue of our contemporary, *The Railway Magazine*, contains an interesting article on "Private-Owners' Wagons." In the adjoining columns we give illustrations of some typical wagons from photographs supplied by the courtesy of the Birmingham Railway Carriage & Wagon Co. Ltd. An editorial article on page 243 deals with "Private-Owners' Wagons—Past, Present, and Future."

PESSENGAHS PROTEST!

Dedicated by "G. H. G.," a reader, to some of those women train announcers:—
Daughter of Stentor, your victims seek a
Little surcease from your speakah.
Madam, we suffer deely peen
To heah you call a train a treen.
It reahly seems you were destined
With eccent overly refained,
For higher steetion (and, I ween
You'd do quite well at Mincing Leen!)
Desist! We pray you. Grant that men may
No more hear "Meedenhead and Henlay."
In consonants and vowels phoney,
There's reahly nothing very toney.
Lady, be good. To you we cry:
Forget that female Old School Tie.—
From "The Star Man's Diary" in "The Star."

A member of our staff who has just returned from a period of Government service on one occasion had some letters returned to him for correction. In writing them he had used the word "agree"; they were returned so that he might alter it to "concur."

A CRUEL HOAX

The London Passenger Transport Board recently has exposed a hoax which has been played on relatives of prisoners-of-war, from whom the board has been receiving parcels of used bus tickets. A letter states that the writer has been informed that, on receipt of a thousand tickets, all bearing a figure "7" in

the serial number, the L.P.T.B. will send a parcel to a prisoner-of-war. The board denies that any such scheme exists, but points out nevertheless that bus tickets are needed urgently for salvage.

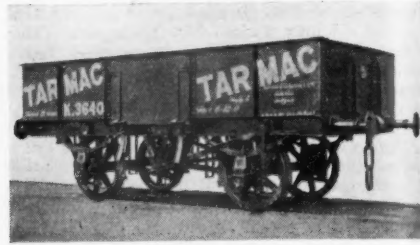
A novel form of inclined railway has been built at Bridgenorth, England. . . . There are two cars, on separate lines of rail, and they are connected by a steel cable passing round a wheel at the top. They are thus balanced, and a preponderating weight is

given whichever one is at the top, by pumping a supply of water into a tank placed in the frame of the car.—From the "Scientific American," August, 1892.

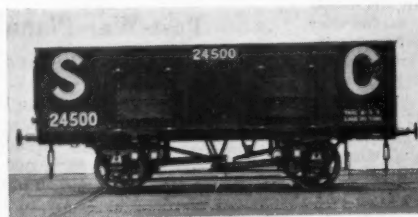
From used paper the L.M.S.R. is making one million new envelopes every month. Many years ago this company created a department to economise on paper, and set up two stationery reclamation depots. Twenty items of L.M.S.R. stationery are supplied entirely from reclaimed paper.



20-ton mineral wagon with steel body



12-ton tar-slag wagon with steel body



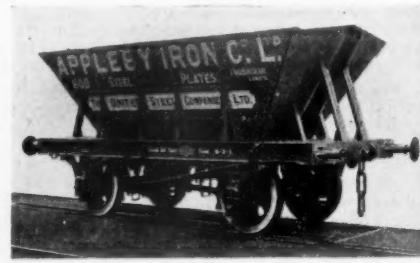
20-ton mineral wagon with steel body



12-ton tar-slag wagon with timber body



12-ton open mineral wagon with timber body



20-ton hopper wagon with steel body



14-ton inflammable spirit tank wagon



10-ton timber-bodied covered salt wagon

Private-Owners' Wagons—Will they continue after the War?

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

WESTERN AUSTRALIA

Perth Tramways

In order to speed up travel on the Perth Tramways, the number of stops made has been reduced by approximately 25 per cent. Previously, stops were made at most street corners, as well as at a number of intermediate points in the city; and, since the introduction of blackout conditions, which have caused further reductions in speed, the time taken for longer journeys had increased to an unwarranted extent.

South Perth Bus Services

South Perth is situated on the south bank of the Swan River, across the river from the City of Perth, and its transport arrangements to and from the city are provided by two ferry services, a tramway service, and a road bus service. The ferry services cater for those living near the river; the tramway traverses the lower portion of the suburb; and the bus service is a through one between Perth and Fremantle, and serves only a relatively small portion of the area adjacent to the main road. By reason of the formation of the suburb, the road services—tram and bus—form practically an equilateral triangle with its central point about half a mile from any route. The bulk of the area within this triangle is occupied by suburban homes, and for some time there has been a demand for improved transport facilities. It is considered that the best way of serving the South Perth district is by trolleybuses, but difficulties of finance as well as of obtaining the buses and overhead equipment has necessitated a deferment of any such scheme for the present. To relieve the position, however, seven petrol buses, with seating capacity for 28 persons each, have been obtained, and these are being put into service on the new route at an early date. This service will place the whole of the South Perth district within easy reach of suitable passenger transport and should satisfy the needs of the residents for some time to time.

CEYLON

Railway Earnings

Although the official statistics concerning railway revenue and expenditure for the first six months of the current year are not available yet, it is understood that income from all sources has been satisfactory; and it is stated that, at a conservative estimate, the average monthly income during the period was about Rs. 200,000 more than that for the corresponding period of last year. Profits, however, are not expected to show a commensurate increase, as war conditions have caused heavy expenditure.

Return Tickets

Suggestions have been made recently that the issue of return tickets should be discontinued. Week-end, excursion, and other types of cheap tickets already have been abolished. Apart from the fact that there has been a falling off in demand for return tickets by third class passengers (although there was more demand by first and second class travellers), the idea of discontinuing the issue of these tickets has been suggested to a great extent by the considerable illicit traffic in return halves, which

continues despite the vigilance of the authorities and their endeavours to make unprofitable enterprise of this kind.

Staff Matters

It is understood that a supplementary estimate has been presented to the State Council for the adjustment of salaries of the combined staff of the Government Stores and the Railway Stores, consequent on their amalgamation. It is proposed that the Government Storekeeper should take over, in addition to his existing duties, the work at present performed by the Railway Storekeeper. It is understood also that a resolution has been presented to the State Council for the temporary appointment of a chief designer for the Mechanical Engineer's Department; the post is vacant at present. A Ceylonese officer now is being trained in India, but he will be unable to take up the appointment for three years.

Transport Expert's Status

The status of Mr. S. W. Nelson, the transport expert whose arrival in Colombo was reported in our May 29 issue, was discussed recently in the State Council. Mr. Nelson is now Director of Transport, and the Government has been criticised for making him a State official after voting money for his services, in the first place, as an expert adviser. In reply to questions, the Minister of Communications & Works said that Mr. Nelson was an independent official under the Minister of Local Administration and himself, and that he was working with a skeleton staff of clerks supplied by the Government Railway; no new department had been formed.

SOUTHERN RHODESIA

Railway Nationalisation

The Prime Minister (Sir Godfrey Huggins) recently referred to the question of state ownership of the Rhodesia Railways. Emphasising his opinion that the State should own monopolistic basic industries such as the transport system, he said that the inference must not be drawn that he favoured immediate purchase. Even if the Rhodesia Railways were acquired, it would be necessary to take over the system in Northern Rhodesia and Bechuanaland as well, which would involve the consent of these two Governments, or partnership with them. In any event the Colony could not acquire the Beira Railway, due to the agreement with the Portuguese, who he believed would take it over in 1946 or 1947. Moreover, the present debenture issue could not be redeemed until 1946. An offer to purchase before that date would require the consent of the debenture holders, which might or might not be given, depending upon the amount of the country's national debt at the time the offer was made. In 1946 the position would change, as debentures then would have to be converted to save the large income tax which would have to be paid on the sinking fund. State purchase then would enable a fresh debenture issue to be made, or the national debt would have to be increased by £20,000,000 to redeem it. Meanwhile, negotiations could be opened with the railways and governments concerned. The Southern Rhodesian Government was conducting an exhaustive inquiry into the financial structure of the

railways, and this would be completed before the present amending Act expired in October, 1943. Although he had reduced the reward to shareholders, he had encouraged the building-up funds to make the railways less of a liability if and when the State took them over. These funds would not increase the purchase price, as they had been built up by users to increase the financial structure. Sir Godfrey Huggins said that the Rhodesia Railways had served the country well, but that he felt that they would have no real peace in the matter until the railways were state-owned and used as an instrument for the development policy of the Colony.

Self-Supporting Policy

Speaking at a recent joint meeting of the Amalgamated Engineering Union and the Railway Workers' Union, the Southern Rhodesian Minister-without-Portfolio (the Hon. L. J. W. Keller) said that it was hoped to provide all work possible for the engineering industry of Southern Rhodesia by prohibiting the importation of articles which could be made in the Colony, and by providing machinery and equipment for the manufacture of essential articles which the community could not import. By this means it was hoped to establish some permanent secondary industries. The Minister forecast drastic control in order to meet essential needs, and added that an advisory committee, on which the trade unions would be represented, would be set up to consider problems as they arose.

UNITED STATES

A New Yard at Galesburg

Approximately \$750,000 is to be spent by the Chicago, Burlington & Quincy Railroad in laying out and equipping a new westbound freight yard at Galesburg, Ill., 162 miles from Chicago, on the principal Burlington main line to Omaha and the west. It will be arranged similarly to the eastbound freight layout at Galesburg, with a receiving yard, a classification yard, and a departure yard; the work required includes the provision of 250,000 cu. yd. of filling material, the rearrangement of 21 miles of existing tracks, and the laying of 14 miles of new tracks. There will be a hump between the receiving and classification yards, with 17 electro-pneumatic car retarders, 38 electro-pneumatic switches, signals controlling the movements of the pusher engines, and teletype equipment between yard office, hump office, and the controlling towers from which the retarders and switches are operated. The work is already in hand.

Recent Signalling Contracts

Centralised traffic control is being installed by the Southern Pacific over 33 miles of the San Joaquin Valley line in California, between Bena and Tehachapi. The control machine will be located at Bakersfield, 15 miles west of Bena, and the C.T.C. code-line circuit thus will extend over a distance of 48 miles. The contract, placed with the Union Switch & Signal Company, includes 27 dual-control low-voltage d.c. switch layouts and 148 searchlight signals. The Missouri Pacific Railroad has ordered from the General Railway Signal Company materials for an extension of the existing centralised traffic control system from Hot Springs Junction to Etta, Ark., a distance of 27 miles. Other recent signalling contracts with the General Railway Signal Company include one placed by the Lehigh Valley Railroad for d.c. block-signal materials to be in-

stalled over 89 miles of double track between Sayne, Pa., and Manchester, N.Y., including the provision of 82 colour-light signals; and one placed by the Board of Transportation of the City of New York for a.c. block-signalling and interlocking equipment on the Culver line of the New York City Transit System, from north of Ditmar Avenue to West Eighth Street, Brooklyn, including a 44-lever locking frame, 103 train-stops with colour-light signals, and 14 switch machines.

Branch Abandonments

During the first five months of 1942 the railways filed 75 applications with the Interstate Commerce Commission for authority to abandon the operation of branch lines, to a total extent of 1,055 miles. This is a considerable advance on the corresponding figure of 739 miles in the first five months of 1941. Such recent applications as that of the Atchison, Topeka & Santa Fe Railway System to abandon 193 miles of line in Kansas and Oklahoma, reported in these columns in our August 28 issue, followed by further applications in respect of 137 miles in Oklahoma, New Mexico, and Texas, and of the Union Pacific Railroad to close down the 70-mile branch from Biggs to Shaniko, in Oregon, show that the process of abandonment tends to accelerate, despite the demands for maintained service arising from the difficulties of the road users, and despite also the recent decision of the Supreme Court that the I.C.C. has power, in such abandonment cases, to impose conditions on the railways as to compensation for the displaced labour. On the credit side, however, the recovered steel from the abandoned tracks has a considerable scrap value.

Closing a Historic Route

Division 4 of the Interstate Commerce Commission now has authorised the abandonment of the 121 miles of line between Lucin, Utah, and Corinne Junction, owned by the Central Pacific Railroad (now a part of the Southern Pacific), as well as of operation by the latter company over 26 miles of Union Pacific line between Corinne and Ogden, Utah. As has been mentioned previously in THE RAILWAY GAZETTE, the line concerned is of historic interest as forming part of the first through railway to the Pacific Coast, completion of which was signalled, on May 10, 1869, by the driving of a golden spike at Promontory Point, where the Central Pacific track met that of the Union Pacific. But the usefulness of this line practically disappeared when the much shorter Lucin cut-off of the Southern Pacific was completed later across the Great Salt Lake.

A Streamliner in Collision

The famous Silver Meteor streamline train of the Seaboard Air Line Railway, operating between New York and Miami, was involved in a serious collision on June 14 at Kittrel, North Carolina, 36 miles north of Raleigh. The streamliner was running about 90 min. late, due to fog, and had been stopped at Kittrel for instructions; while standing it was run into from the rear by a following freight train. Eight passengers were killed, and eight more and two employees were injured, in the observation car, the rear end of which was demolished, but such is the strength of construction of the modern stock that the rest of the 17-coach formation suffered little damage, and was able to continue its run. The freight locomotive

was damaged considerably, but kept the rails. The cause of the collision has not been ascertained, although fog was no doubt largely responsible; the signalling equipment at Kittrel was in perfect order. A tragic outcome was the suicide of the Division Superintendent about two hours after the accident, as the result of nervous strain.

ARGENTINA

Construction of International Railway

A decree issued by the Argentine Government authorises the State Railways' administration to obtain on loan from the Province of Buenos Aires Railway the necessary quantities of steel rails and other materials wherewith to construct the 90 km. of track required to complete the Argentine section of the new Chile-Argentina international railway from Salta to Socompa, on the Chilean frontier. (Details concerning the construction of this line were published in THE RAILWAY GAZETTE of October 31 and December 5, 1941, and May 15, 1942.)

Interchange of Rolling Stock

The Argentine Ministry of Public Works has issued a decree approving an agreement recently entered into by the Argentine State Railways administration with the Villazon-Atocha Railway, operated by the Bolivian Government, and with the Antofagasta-Bolivia and Bolivia Railways for the interchange, or loan of, passenger and goods rolling stock between the systems named, with a view to developing and facilitating tourist movement and commercial traffic between the two republics. The interchange will be effected at La Quiaca-Villazon Junction on the Argentine-Bolivian frontier.

SWITZERLAND

Railway Centenary

The creation of a national traffic museum, to be opened in August, 1947, on the occasion of the centenary of the first Swiss railway, was brought a step nearer by the constitution in February last of an association for the promotion of a Swiss Museum of Communications & Transport. Its president is Dr. Cottier, formerly Secretary-General of the Federal Railways, later Manager of the 3rd Division, and now Director of the Federal Transport Department, who presided also over the study commission set up in 1939 to make preliminary contacts and investigations. The results so far achieved are due to a great extent to the activities of M. Eugène Fontanellaz, the future Director of the museum, who is a former official of the Federal Department of Industry & Labour and has considerable experience of railway matters, having been for some years a locomotive engineer at the Skoda Works. The earlier stages in the preparations were referred to in an editorial note in THE RAILWAY GAZETTE of April 17. The museum is to be in Zurich, most probably near the site of the transport section of the National Exhibition of 1939, on the left shore of the lake, with track connection to the adjacent Zurich-Wollishofen Station. It will be divided into six sections, concerning water, road, rail, air, communications (post office, telephone, telegraph, and radio) and tourist traffic, respectively; each will be housed separately but will have connecting galleries. In addition to numerous documents, photographs, maps, and charts, it is intended to show a large range of models, to a uniform scale of one-tenth, representing locomotives, carriages, and wagons of the principal Swiss railways at various

periods, and the co-operation of Swiss model-railway clubs may be enlisted in this connection. Appeals have been made to railwaymen and the general public for contributions in the way of documents, tickets, and other items of particular interest, relating especially to the earlier years of railway history. Full-size exhibits include one of the original cars of the Vevey-Montreux-Chillon Tramway (the first electric tramway in Switzerland), and electric locomotive No. 2 of the Burgdorf-Thun Railway. The first locomotive of the Rigi Railway, which was shown at the National Exhibition in 1939, also has been preserved. Unfortunately, none of the original locomotives of the first Swiss Railway, from Zurich to Baden, are in existence, nor were any complete drawings available; but by careful research at Esslingen and Karlsruhe M. Fontanellaz has been able to assemble authentic data regarding the first engine, named *Limmat*, and these are being co-ordinated at present with a view to the construction of a replica, which, together with coaches, will be prominent in the celebrations and afterwards will tour the country before going to the traffic museum.

FINLAND

Railway Construction

After the Russian-Finnish peace treaty of March, 1940, the Finnish State Railways operated a reduced system excluding the lines in the territory round the northern half of Lake Ladoga which was ceded to Russia. Of the four railways crossing the new border, only the main line to Viipuri and Leningrad remained open; the other three thenceforth were operated only to the last station inside the new frontier in each case, namely Imatra, Parikkala, and Kaurila. As Hanko also had been ceded to Russia, the new terminus of the line serving it was at Tammisaari; operation on the section to Hanko was abandoned for the time being. Soon after the cessation of hostilities, the interrupted construction of new lines was resumed on the sections Varkaus-Viinjärvi (63 miles), opened towards the end of April, 1940; Pori-Haapamäki (120 miles) already opened to public traffic as far as Virrat, 25 miles from Haapamäki, and soon afterwards brought into service; Kontiomäki-Taivalkoski (85 miles); Suolahti-Haapajärvi (105 miles); and Orivesi-Jämsä (42 miles). Surveys and plans for the proposed new railway linking Kemijärvi and Kandalaksha, on the Murmansk line, were prepared, and construction was begun from the Kemijärvi end on the first section, which later was diverted towards Salla, in territory ceded to Russia, but now retaken by the Finns. Other construction work taken in hand involved a loop line at Simola to give direct access, without reversing, from the Helsinki direction to the new frontier line to Lappeenranta. This line has been extended from Virasjoja, the junction (1½ miles before the old terminus at Vuoksenen) of the two lines from Viipuri, one *via* Simola, and the other *via* Imatra, to Simpele, 26 miles further north. It was intended originally to reach Elisenvaara Junction, but afterwards was to be diverted to Parikkala; it is not known, however, whether work on this section has commenced. A bus service connected the two stations when the second war broke out with Russia. Construction on two other lines (Parkano-Seinäjoki and Joensuu-Ilomantsi) appears to have been at a standstill since the first war. A map of Finland, showing the approximate areas ceded to Russia, and lines under construction, was published in our March 29, 1940, issue.

Developments in Tunnelling Methods—I

Describing tunnels in self-supporting soil and that which is not self-supporting, tunnelling with shields, and under-water tunnels

The 28th Thomas Hawksley lecture, entitled "A Century of Tunnelling," was delivered by Mr. W. T. Halcrow before the Institution of Mechanical Engineers on November 21 last. The following notes made from this lecture describe the various methods of tunnelling in different kinds of soil and the developments in those methods during the past 100 years.

TUNNELLING may be classified roughly under four main headings: (1) tunnels in rock and self-supporting ground; (2) tunnels in soft soil, which is not self-supporting; (3) those constructed with the use of shields; and (4) under-water tunnels. The methods of tunnel construction depend upon the soil encountered and upon scientific, mechanical, pneumatic, and electrical progress, and in some instances upon extraneous conditions. For instance, the old London Metropolitan and District Underground tunnels, opened in 1863 and 1868 respectively, were built on the cut-and-cover principle with brick arches, because the modern type of deep (tube) tunnelling by the methods then available would have proved prohibitively costly and hazardous in execution. On the other hand, subsequent rapid rise in the cost of land would make cut-and-cover methods equally prohibitively costly today.

Improved Tunnelling Methods

Scientific progress leading to improved tunnelling methods has made possible the economical construction of tunnels of increased length and size, and the carrying out of the work in more difficult soil. Examples of this progress are the introduction of power drills and improved drill steel, improvements in explosives, mechanical disposal of spoil, better lighting and ventilating, the use of electricity and compressed air for tools and plant, of concrete and cast iron for tunnel linings, of shields for tunnelling, of compressed air for working in water-bearing soil, and of improved pumping machinery. All these developments have contributed to greater speed of construction and reduction of cost, and have made tunnelling practicable where methods available a century ago would not.

There is one condition that may affect the methods employed for dealing with any of the classes (1), (2), or (3), as well as class (4) mentioned above, and that is the presence of water either in fissures in self-supporting soil or percolating through softer ground. The use of compressed air has revolutionised tunnelling in water-bearing strata. It enables the pressure in a tunnel working to be raised sufficiently above atmospheric pressure to balance the head of water flowing and to prevent percolation into the working. The limit of endurable air pressure is about 35 lb. to 40 lb. per sq. in. above atmospheric pressure, corresponding to a static head of 80 ft. to 90 ft. of water. The main difficulty is to retain the pressure against leakage, which in a large tunnel is caused by the difference of hydrostatic pressure between the top and bottom of the tunnel. The absolute necessity if the labour is to be kept fit is for the pressure to be released gradually.

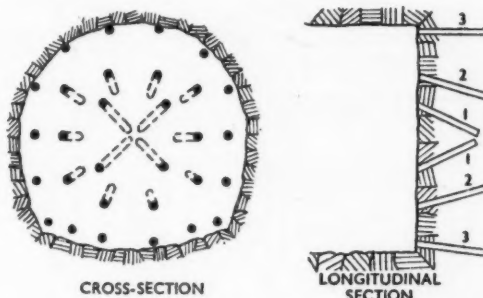
(1) TUNNELS IN SELF-SUPPORTING GROUND

As tunnelling in self-supporting ground requires neither timbering nor permanent lining, its problems are confined to expeditious excavation and removal of the spoil. Compact chalk is the ideal material for this class of tunnelling, but granite and other hard rocks are also comparatively easy to work in, provided they are sound and free from water-bearing fissures. Of the three operations required for this kind of tunnelling, namely, drilling, blasting, and removing the spoil, the third generally governs the all-important rate of progress. A century ago hand-drilling or jumping with a bar was necessary, whereas today power-drilling is

universal, infinitely quicker, and better in every way. Similarly, mechanical plant for clearing away the spoil is a vast improvement upon the old hand-loading into wagons or "tubs." It does, however, require space and entails a minimum cross section of tunnel. Method of spoil removal does not vary with the class of tunnelling as excavation does.

Headings and Drilling

The minimum convenient size for a heading is 5 ft. × 6 ft., and this heading is usually driven in advance of the main tunnel, and widened out to the full tunnel section later. The heading may be driven centrally, or at the top or at the bottom of the final cross-section of the tunnel. Wide American experience favours a top heading with a bench,



Method of drilling tunnel in rock

the length of which may be $1\frac{1}{2}$ to 2 times the width of the tunnel. In drilling the heading the holes are drilled at an angle to the face so as to cut out a central wedge or cone of rock first; the outer or rim holes are fired later to enlarge the excavation to the full size of the heading. Alternatively, a heavier explosive charge may be used in the rim holes; the charges are electrically fired.

Usual practice is to make one hole for each 3 sq. ft. of face in igneous rock, and one for 5 sq. ft. of sedimentary rock. The length of the holes is generally at least 6 ft. to 8 ft. and often 14 ft. or 15 ft. Longer holes have been used but are not usually economical or satisfactory. For expeditious working, the length of the holes should be fixed to suit the shift. The cycle of operations varies with conditions, but a typical example is: blasting heading and bench, 2 hr.; clearing heading, 2 hr.; setting up columns for drills, 2 hr.; and drilling and clearing, 6 hr.; total 12 hr., thus suiting a two-shift day. For a three-shift day shorter holes would be used.

As compared with black powder, invariably used 100 years ago, gelignite or some other high explosive is now generally used; 60 per cent. low-freezing gelatine is the most common. Liquid air may be used for surface work.

Shafts and Adits

Short tunnels are driven from the two ends only, but longer ones require intermediate vertical shafts or adits. Where the topography allows of adits, they are preferable to shafts, as the removal of soil through them is easier; each adit or shaft allows of two more working faces and therefore increases speed of progress. As additional adits or shafts are costly, their use should be decided by balancing the extra cost against the shorter time, where time is a vital factor. A 1 to $1\frac{1}{2}$ -mile drive from a face should not, however, be exceeded if it can be avoided. It may pay to divert and so slightly lengthen a tunnel to secure additional adits or shafts. Rate of progress depends upon the size of the tunnel and upon very varying conditions.

For railway tunnels in solid rock, lining is required only if patches of soft or friable rock are encountered, needing protection; but in laminated rocks, such as shales, lining is essential especially if water percolation is evident. For water-carrying tunnels requiring a smooth internal surface, concrete lining is necessary. Where absolute water-tightness must be secured, a separate inner lining is desirable, allowing

percolation through the outer walls to drain away through the space between the inner and outer linings.

(2) TUNNELLING IN NON-SELF-SUPPORTING SOILS WITHOUT A SHIELD

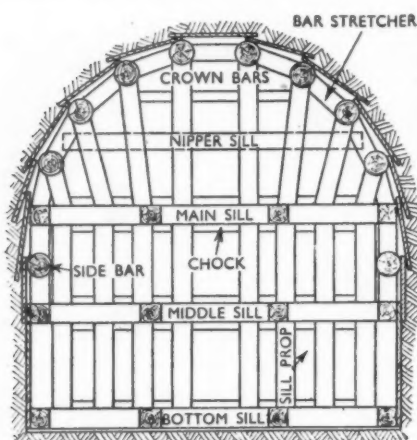
In this class of tunnelling, timbering is required to prevent the roof and sides from caving in during construction; subsequent lining is essential. Though actual excavation is easier than in rock, various difficulties outweigh this advantage. Materials for timbering have to be brought up, introducing two-way loaded traffic. Timbering takes time to erect and restricts working space. Where there is running sand or mud the face has to be supported. To this end, cement

be transported conveniently on a conveyer belt, or concrete may be pumped through pipes to the work site. In long tunnels steel shuttering on travelling carriages is often used.

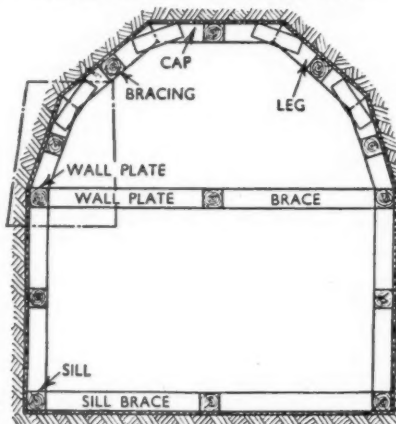
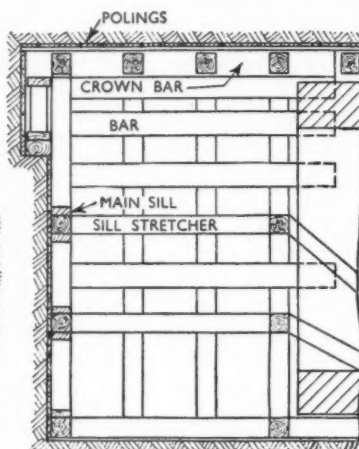
(3) TUNNELS CONSTRUCTED WITH SHIELDS

In soft and treacherous ground a shield is best used. It consists essentially of a short tube covering the periphery of the tunnel and stiffened against external pressure. Under cover of this, excavation is carried on at the face, and, as it proceeds, the shield is forced forward by jacks placed round its circumference thrusting against the completed lining which follows close behind the shield. The back end of the shield is extended by a short length free of any internal structure, and the lining is built inside this extension. As the shield moves forward, a space is left between the lining and the excavated side and arch of the tunnel, which is at once grouted with cement or lime. The lining is generally in the form of cast-iron segments bolted together to form a ring; no shuttering or centring is required as with a concrete or brick lining. As each ring is completed, it is ready to take the thrust of the shield instead of having to wait for the concrete or mortar to set.

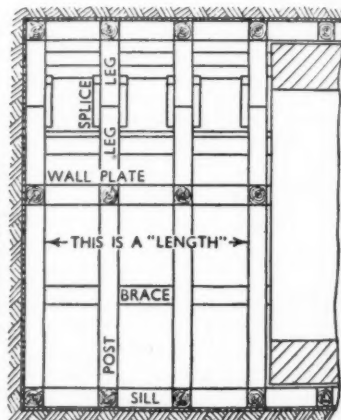
The shield has revolutionised tunnelling in semi-fluid soils, and has made possible many schemes impracticable without it, but it is not necessarily the best antidote for all soft soils and is seldom used for short tunnels. Its greatest advantages are the safety it provides in treacherous soil, and the



Above: English method of timbering



Right: American method



grouting or chemical consolidation and heat treatment in the case of mud may be used. There are several methods of timbering. The English and American systems are shown in the diagrams; the Italian method, also illustrated, was described in our issue of August 7, 1936, as employed in the construction of the great Apennine tunnel on the Bologna-Florence *direttissima* line. Briefly, a bottom heading was first driven and was shored up with a lining of wooden wedge-shaped blocks in place of ordinary timbering, the cross section being circular. It was found that this method increased progress by 50-90 m. a day. The top heading was afterwards driven, the spoil from it and its enlargement to full section being dropped into trucks in the bottom heading.

A recent innovation is the use of pressed-steel liner sheets supported by steel ribs, making for lightness and portability and saving valuable space when erected. In cases where compressed air is used, the steel sheeting also reduces air leakage. The steel liner is usually left in when concrete lining is placed, and, where settlement is likely to occur, the space behind the liner may be cement grouted.

Owing to restricted space, excavation in soft soil is usually done by hand. Materials for a brick or concrete lining may

be transported conveniently on a conveyer belt, or concrete may be pumped through pipes to the work site. In long tunnels steel shuttering on travelling carriages is often used.

(To be continued)

DANISH STATE RAILWAYS FINANCIAL RESULTS.—The Danish State Railways report substantial increases in receipts for the financial year ended March 31, 1942, as compared with the results in the preceding financial year. Particulars are given below:—

	Year to March 31	
	1942	1941
	Danish kroner	Danish kroner
Passenger receipts	101,530,000	75,800,000
Goods and livestock receipts	114,660,000	96,870,000
Postal receipts	8,060,000	7,370,000
Other receipts	8,640,000	6,990,000
Total working receipts	232,890,000	187,030,000
Total working expenditure	181,420,000	159,050,000
Working surplus	51,470,000	27,980,000
Depreciation	57,150,000*	36,720,000†
Interest service	15,060,000	15,950,000
State subsidy	20,740,000	24,690,000

* Of which extraordinary depreciation, kroner 50,000,000.

† Of which extraordinary depreciation, kroner 29,000,000.

Streamline Development in the United States—I

American railways have over 130 streamline trains in service, for which more than 1,000 lightweight cars have been built. During 1941, 34 new streamliners were put into service

DESPITE the shadow of impending war, the year 1941 witnessed widespread activity in the United States in the introduction of high speed streamline trains, composed of new lightweight stock, the majority of them with diesel-electric haulage, but in certain cases with steam power. In all, 34 new trains have been put into service, made up of 265 cars, and they bring the number of fully streamlined American flyers to 131, with a total of just over 1,000 cars. This does not include many streamline branch trains which are running in connection with the long-distance services, nor trains which are operating with mixed formations of streamline and standard cars, nor trains composed of older equipment which has been modernised. The statistics given in the annexed table of American streamliners, which has been compiled from data appearing in the passenger progress number of our American contemporary, the *Railway Age*, dated November 22, 1941, were made up to that date; since then the New York Central has put into service two new 16-car trains for the Empire State Express; the Chicago & North Western has installed five 6-car trains of the 400 type on new services in Wisconsin and Minnesota; and the Denver & Rio Grande has its two 2-car Prospectors working between Denver and Salt Lake City by the Moffat tunnel route; two 7-car Colorado Eagles are at work on the Missouri Pacific route between St. Louis and Denver; and two new sets of 11 cars each have taken over the Illinois Central's Panama Limited between Chicago and New Orleans. Six new trains, totalling 84 cars, being built for the joint Overland Limited service of the North Western, Union Pacific, and Southern Pacific between Chicago and San Francisco; three new Golden State Limited trains of 28 cars for joint operation by the Rock Island & Pacific and Southern Pacific between Chicago and Los Angeles; and 18 new cars for the New York—St. Petersburg run of the Atlantic Coast's Tamiami Champion, are likely, however, to be held up by war conditions. The Southern also has two-car units at work between Birmingham and Columbus, 122 miles, and Sheffield and Parrish, 96 miles, but the Vulcan has been withdrawn from the 295-mile Meridian—Chattanooga run. Also the southbound run of the Ann Rutledge of the Alton RR. has for the present been turned over to steam propulsion.

Chicago Services

Of the developments during 1941, several deserve mention. It was actually late in 1940 that the Chicago, Milwaukee, St. Paul & Pacific RR. opened up high speed competition in a new direction with its streamlined steam-hauled Mid-West Hiawatha on an 8-hr. run between Chicago and Omaha, 488 miles. The Chicago, Burlington & Quincy promptly countered by putting into service a diesel-hauled Ak-Sar-Ben Zephyr, using the equipment in the opposite direction as an advance portion of the Exposition Flyer, and also doing the Chicago—Omaha run over its 496-mile route in both directions in 8 hr. Both the Burlington and the Chicago & North Western previously had streamline services in operation between Chicago and points west of Omaha, the former the Denver Zephyr and the latter the series of "City" trains, taking 7½ hr. or slightly less for the Chicago—Omaha journey, but Omaha arrivals and departures in the middle of the night have not made these suitable for Omaha passengers. As to the "City" trains, doubling of both the City of Los Angeles and City of San Francisco with new 17-car formations during 1941 has made possible departures by both every third day in each direction. With the daily City of Denver and the City of Portland every sixth day, the North Western and Union Pacific have had seven streamliners all operating for distances of 995 to 1,048 miles at overall average speeds of 65.6 to 67.2 m.p.h., stops included; the western

half of the journey of the Cities of Los Angeles, San Francisco, and Portland pulled the overall averages down somewhat, due to the heavy grades through the mountains, but even so the end-to-end speeds were from 56.9 to 57.8 m.p.h. As a war measure, these trains have since been slowed by 2 hr. each way to overall times of 41½ hr. and the City of Denver and Denver Zephyr have been slowed from 16 hr. to 17 hr.

To the West and South

An important addition to streamline workings in 1941 has been those of the Southern Railway, with the Southerner, an all-coach streamliner working between New York and New Orleans, 1,386 miles, and the Tennessean, between Washington and Memphis, 929 miles. The latter is of interest in that between Lynchburg and Bristol it is worked over Norfolk & Western metals for 203½ miles by streamlined N. & W. steam locomotives, whereas the Washington—Lynchburg and Bristol—Memphis stages of the Southern journey are with diesel-electric haulage. The Southerner is hauled by electric power over the Pennsylvania between New York and Washington, and by Southern diesel-electric power between there and New Orleans. Late in 1940 the Rock Island & Pacific added to its diesel fleet the Choctaw Rocket, on a 761-mile course due east and west between Memphis, Oklahoma City, and Amarillo; in January, 1941, the Rock Island and the Burlington jointly instituted overnight a Zephyr-Rocket diesel service between St. Louis and Minneapolis, 585 miles. Another Rock Island venture, which proved successful, was the Arizona Limited, a seasonal all-Pullman diesel streamliner running on alternate days between Chicago and Phoenix, on the Southern Pacific, and serving the well-known winter resorts of Arizona; the length of journey is 1,916 miles. An important co-operative experiment, the first of its kind, was inaugurated in December, 1940, when ten railways combined to provide a daily all-coach streamline service between Chicago and Miami, Florida, over three different routes, turn and turn about, with identical starting times and 29½ hr. duration of journey. This brought into operation the City of Miami of the Illinois Central, diesel-hauled throughout, and the Dixie Flagler of the Chicago & East Illinois and the South Wind of the Pennsylvania, both with steam haulage; for the two latter all the railways concerned in the haulage have applied semi-streamlining to selected steam locomotives. The only remaining diesel innovation of 1941 has been the Land o' Corn of the Illinois Central, a two-car unit running between Chicago and Waterloo on a daily round of 550 miles.

New Steam Streamliners

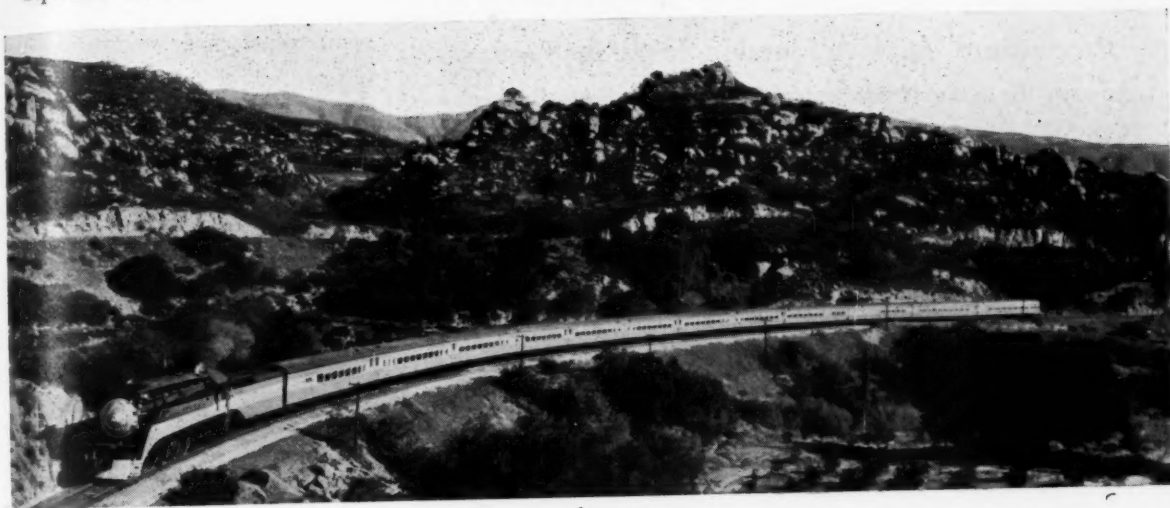
In addition to the steam-hauled streamliners already mentioned, some important additions have been made during 1941 to the trains of streamlined stock with steam power. The Southern Pacific has installed the San Joaquin Daylights by day between Los Angeles and Oakland (San Francisco), by the inland Merced route, and the all-Pullman Lark sleepers between Los Angeles and San Francisco by the coast route, over which the streamlined morning and noon Daylights were already operating in each direction. The New York Central system added the James Whitcomb Riley on a round trip of 605 miles daily over its Big Four subsidiary between Chicago and Cincinnati. In conjunction with the various streamline services between Chicago and the Twin Cities, the James Whitcomb Riley makes it possible to complete the 713 miles between Cincinnati and St. Paul in as little as 12 hr., without night travel, at an average of 59.4 m.p.h. On the Pennsylvania the all-coach Jeffersonian was put into service between New York and St. Louis, taking 20½ hr. for the 1,051 miles, and carrying through coaches between Washington and St. Louis. In the purely electric realm the most interesting introduction of 1941 has been of the streamlined four-car Electroliners of the inter-urban Chicago, North Shore & Milwaukee, which, once clear of 12 miles of elevated city tracks in Chicago, and 3 miles of street trackage in Milwaukee, run on very fast point-to-point timings between fairly numerous stops. It will be remembered that this high speed tramway suspended operation for some time owing to economic difficulties, but the introduction of these trains has notably restored the prestige of the line and has stimulated the development of a new *esprit de corps* among the staff.

TABLE I—STREAMLINE TRAINS IN THE UNITED STATES, 1941

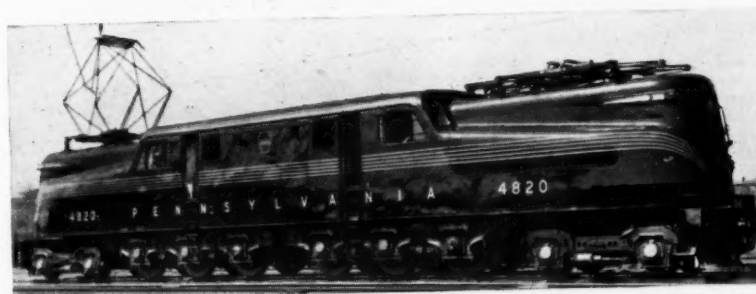
Railway	Train	Between	Single or return journey	Mileage covered		Overall Average speed	No. of cars per train			Formation	No. of trains	Date of introduction
				Per trip	Per month		Total	Excl. power	Power			
Diesel-Operated				Miles	Miles	M.p.h.						
C. Burlington & Q.	Denver Zephyr	Chicago—Denver	S	1,037	31,110	65.4	14	12	2	PSC	2	8.11.36
"	Twin City Zephyr	Chicago—Minneapolis	R	874	26,220	70.4†	8	7	1	PC	2	18.12.36
"	Texas Zephyr	Denver—Dallas	S	832	24,960	46.7	8	8	1	PSC	2	23.8.40
"	General Pershing Zephyr	St. Louis—Kansas City	R	558	16,740	55.8	5	4	1	PSC	1	26.4.39
"	Mark Twain Zephyr	St. Louis—Kansas City	R	558	16,740	55.8	3	2	1	PC	2	25.9.38
"	Ak-Sar-Ben Zephyr (a)	Lincoln—Omaha—Chicago	S	551	16,530	62.0	5	4	1	PC	2	11.12.40
"	Silver Streak Zephyr	Lincoln—Omaha—Chicago	R	502	15,060	50.9	4	3	1	PC	1	15.4.40
"	Pioneer Zephyr	Chicago—Phoenix	R	442	13,260	40.4	4	3	1	C	1	30.4.40
Rock Island & Pacific	Arizona Limited (f)	Chicago—Chicago	S	1,916	28,740	—	8	7	1	PS	2	15.12.40
"	Rocky Mountain Rocket	Chicago—Denver	S	1,084	32,520	57.5	8	7	1	PSC	2	12.11.39
"	Choctaw Rocket	Memphis—Amarillo	S	761	22,830	45.9	5	4	1	PSC	2	17.11.40
"	Des Moines Rocket	Chicago—Des Moines	R	716	21,480	59.7	5	4	1	C	1	19.9.37
"	Peoria Rocket	Chicago—Peoria	2 R	644	19,320	62.3	5	4	1	C	2	15.11.38
"	Kansas—Dallas Rocket	Kansas City—Dallas	S	677	20,310	57.0	5	4	1	C	2	29.9.37
"	Kansas—Minn. Rocket	St. Louis—Minneapolis	S	489	14,670	54.4	4	3	1	PC	2	7.1.41
Burlington—Rock Is.	Sam Houston Zephyr	Fort Worth—Houston	R	566	16,980	62.5	4	3	1	PC	1	1.10.36
"	Texas Rocket	Houston—Fort Worth	R	566	16,980	62.5	4	3	1	PC	1	3.11.38
A.T. & Santa Fe	Super-Chief (b)	Chicago—Los Angeles	S	2,228	19,097	56.1	11	9	2	PS	2	15.6.37
"	El Capitan (b)	Chicago—Los Angeles	S	2,228	19,097	56.1	8	7	1	C	2	22.2.38
"	Chief	Chicago—Los Angeles	S	2,228	22,280	47.6	13	11	2	PS	6	17.4.38
"	Kansas Cityan	Chicago—Oklahoma City	S	851	25,530	55.0	7	6	1	PC	1	17.4.38
"	Chicagoan	Oklahoma City—Chicago	R	851	25,530	55.0	7	6	1	C	2	1.7.38
"	Golden Gate	Oakland—Bakersfield	R	626	18,780	56.1	7	6	1	PC	2	10.12.38
"	San Diegoan	Los Angeles—San Diego	R	512	15,360	52.8	10	9	1	PC	2	27.3.38
"	Tulsa	Kansas City—Tulsa	R	512	15,360	54.0	6	5	1	PC	2	22.2.38
Chicago & N.W.	The 400	Chicago—Minneapolis	S	419	25,140†	65.4†	12	10	2	PSC	2	6.6.35
C.N.W.—Union Pacific	City of Los Angeles (c)	Chicago—Los Angeles	S	2,299	22,990	57.8	10	9	1	PSC	2	18.6.36
"	City of Portland (c)	Chicago—Portland (Oregon)	S	2,260	22,600	56.9	14	11	3	PSC	2	14.6.35
"	City of Denver	Chicago—Denver	S	1,048	31,440	66.0	17	14	3	PSC	2	31.1.35
C.N.W.—U.P.—S.P.	City of San Francisco (c)	Chicago—San Francisco	S	2,272	22,720	57.2	17	14	3	PSC	2	1.4.41
Union Pacific	City of Salina	Salina—Kansas City	R	374	11,220	53.6	3	2	1	C	3	17.5.41
Southern	Southerner (d)	New York—New Orleans	S	1,386	27,720	47.4	9	8	1	PSC	3	24.8.39
"	Tennessee (e)	Washington—Memphis	S	929	18,580	40.8	10	9	1	C	2	11.10.39
"	Vulcan	Chattanooga—Meridian	S	295	8,850	35.4	2	1	1	C	2	29.9.39
"	Cracker	Atlanta—Brunswick—Jesup	S	316	9,480	28.6	2	1	1	C	1	17.12.40
"	Goldenrod	Birmingham—Mobile	S	266	7,980	36.1	2	1	1	C	1	17.11.40
Illinois Central	Joe Wheeler	Chicago—St. Louis	R	497	14,910	34.3	2	1	1	C	1	28.10.41
"	Land o' Corn	Chicago—Miami	S	1,493	29,860	50.6	8	7	1	C	1	17.11.40
"	Miss Lou	Chicago—Waterloo	R	550	16,500	48.2	2	1	1	C	1	28.6.40
Baltimore & Ohio	National Limited	Jackson (Miss)—New Orleans	S	366	10,980	48.6	1	—	—	PSC	1	23.11.38
"	Capitol Limited	New York—St. Louis	S	1,112‡	33,360	44.2	13	11	2	PSC	2	26.9.37
Chicago & Alton	Royal Blue	New York—Chicago	R	997§	29,910	48.6	15	13	2	PC	1	1.7.35
"	Abraham Lincoln	New York—Washington	R	447	13,410	55.6	10	8	2	PC	1	26.7.37
Missouri Pacific	Missouri River Eagle	Chicago—St. Louis	R	568	17,040	57.8	9	8	1	PC	2	10.3.40
"	Delta Eagle	St. Louis—Chicago	R	568	17,040	57.8	10	9	1	PC	2	11.5.40
Seaboard	Silver Meteor (g)	Memphis—Tallulah	R	518	15,540	40.3	3	2	1	C	1	1.11.41
Atlantic Coast	Champion (g)	New York—Miami	S	1,368	27,360	55.8	20	17	3	PSC	2	1.12.39
Florida East Coast	Champion (g)	New York—Miami	S	1,328	26,560	54.2	16	14	2	PSC	1	1.12.39
K.C.S.—L.A.	Southern Belle	Kansas City—New Orleans	S	873	17,460	40.5	6	5	1	PSC	3	1.10.40
Gulf, Mobile & Ohio	Rebel	Jackson (Tenn.)—New Orleans	S	497	14,910	35.2	4	3	1	PC	2	1.4.35
Boston & Maine	Flying Yankee	Boston—Bangor	2R	734	17,615	51.0	3	2	1	C	1	5.6.35
N.Y. New Haven & H.	Comet	Boston—Providence	5R	440	13,200	55.0	3	1	2*	C	2	15.7.40
Diesel Cars	Diesel Cars	New York—Paterson	—	430	12,900	—	1	—	—	C	2	15.6.38
Steam-Operated												
New York Central	20th Century Ltd.	New York—Chicago	S	950	28,740	59.9	12	12	—	PS	4	28.7.39
"	Pacemaker	New York—Chicago	S	961	28,830	56.5	9	9	—	C	2	15.6.38
"	Mercury	Cleveland—Chicago	S	448	13,440	58.7	8	8	—	PC	2	28.4.41
"	James Whitcomb Riley	Cincinnati—Chicago	R	605	15,730	57.6	7	7	—	C	1	15.6.38
Pennsylvania	Broadway Ltd.	New York—Chicago	S	903	27,090	56.4	8	8	—	PS	2	28.7.39
"	Trail Blazer	New York—Chicago	S	903	27,090	53.1	9	9	—	C	2	19.12.40
"	South Wind (h)	Chicago—Miami	S	1,559	31,180	52.8	8	7	—	PC	2	10.1.40
Southern Pacific	Morning Daylight	San Francisco—Los Angeles	S	470	14,100	49.5	18	18	—	PC	2	21.3.27
"	Noon Daylight	San Francisco—Los Angeles	S	470	14,100	48.7	18	18	—	PC	2	4.7.41
"	San Joaquin Daylight	San Francisco—Los Angeles	S	490	14,400	40.5	14	14	—	PS	2	1.5.41
"	Lark	San Francisco—Los Angeles	S	470	14,100	37.5	18	18	—	PC	2	19.12.37
"	Sunbeam	Houston—Dallas	R	528	15,840	60.0	6	6	—	PC	2	21.1.39
Milwaukee	Morning Hiawatha	Chicago—Minneapolis	S	422	12,660	60.8	11	11	—	PC	2	29.5.35
"	Afternoon Hiawatha	Chicago—Minneapolis	S	422	12,660	65.6	8	8	—	PC	2	1.12.40
"	Mid-West Hiawatha	Chicago—Omaha	S	488	14,640	61.0	6	6	—	PC	1	17.12.37
Reading	Crusader	New York—Philadelphia	2R	360	10,830	56.7	5	5	—	C	1	17.12.40
Chicago & E. Illinois	Dixie Flagler (k)	Chicago—Miami	S	1,455	29,110	49.3	7	7	—	C	1	9.2.41
Electrically-Operated												
Chicago, N. Shore & M.	Electroliners	Chicago—Milwaukee	SS	444	13,320	60.0	4	4	2*	C	2	9.2.41

* Power unit car includes mail and baggage space, and in certain cases passenger seating also. † Between Chicago and St. Paul. ‡ Diesel unit returns with night sleeper at lower speed. § Diesel units changed at Washington. || Between Chicago and Milwaukee city limits. ¶ P: Parlour cars. PS: Pullman sleeping cars. C: coaches.

(a) Returns as Advance Exposition Flyer. (b) Twice weekly. (c) Each train ten single journeys monthly. (d) Worked by Pennsylvania electric power New York—Washington, 225 miles. (e) Worked by Norfolk & Western steam power Lynchburg—Bristol, 203 miles. (f) One return journey every three days; operated over Central of Georgia, Atlantic Coast, and Florida East Coast lines. (g) Operated over Pennsylvania and Richmond, Fredericksburg & Potomac lines New York—Richmond. (h) One return journey every three days; operated over Louisville & Nashville, A.C.L. and F.E.C. lines. (i) One return journey every three days; operated over L. & N., Nashville, Chattanooga & St. Louis, Atlanta, Birmingham & Coast, A.C.L. & F.E.C. lines. (j) Every alternate day, winter season only.



The Daylight, Southern Pacific RR. streamliner, en route between San Francisco and Los Angeles



Right: Streamline express electric locomotive, Pennsylvania Railroad



The Twin Cities 400 diesel-hauled streamline train, Chicago & North Western RR., leaving Chicago for St. Paul and Minneapolis

Precautions Against Lineside Fires in Sweden

Some of the methods adopted by the Swedish State Railways



Distributing fire buckets and supplies of moss for smothering the flames

EACH year during the warm season and long periods of dry weather, the danger increases of fires being started by sparks from locomotives, especially those using certain kinds of fuel, and the Swedish State Railways have taken special measures to deal with the problem. Information which has recently reached London shows that during the present summer locomotives burning wood are being provided with spark arresting apparatus and great care is being taken to see that the ashspans are tight and that nothing glowing is allowed to fall on the permanent way. Special instructions are issued to drivers advising them of the sections of line where forcing of their engines should be carefully avoided, because of the risk of starting fires.

As far as possible, the immediate vicinity of the line has been cleared of all material likely to become ignited and so cause fire to spread. Special fire-watch patrols have been organised, provided with the extinguishing equipment, and at intervals along the line buckets of water, spades, and axes have been placed. Telephonic communication has been established between places where risk is particularly to be feared and the nearest station where staff is on duty, and the distance between telephones is kept reasonably small. The railway authorities have enlisted the co-operation of the county fire authorities in removing as much

as possible all easily-kindled material from the sides of the line, especially where locomotive sparks are known to have started fires on previous occasions.

By the distribution of printed matter

and the showing of films, railway passengers and the public generally have been instructed on the precautions they should observe to prevent fires and the risks attending the dry time of year.



Testing emergency fire telephone



Using jet pump carried on watchman's trolley

COMPAGNIE INTERNATIONALE DES WAGONS-LITS.—This company floated various debenture loans in the years preceding the war, for example, in the United Kingdom, Belgium, Holland, and Switzerland. In view of the extra-ordinary circumstances brought about by the war, debenture holders agreed in 1940 to the temporary suspension of the interest service. The 4 per cent. debenture loan taken up in Holland amounted to fl. 12,500,000 and was due for redemption as from 1938. After representations had been made by the company, the Dutch debenture holders agreed in February, 1941, to the postponement of the interest service until August 1, 1942. The company recently again approached the trustee administrators of the loan seeking suspension of the interest for a further period, on the ground that the circumstances which

had justified the first suspension still obtain. Negotiations are in progress also with the Belgian and French debenture holders. The company proposes to postpone the payment of the interest due on February 1 and August 1, 1941, as well as on February 1 and August 1, 1942, until August 1, 1943, with the proviso that the interest which fell due on August 1, 1940, shall be paid as soon as the debenture holders agree to the proposal. The company further undertakes to refrain from concluding any financial agreement with any other group before August 1, 1943; these terms should be more favourable than the agreements concluded with the debenture holders. The company is prepared finally to make only such payments as are really necessary for the maintenance of its services. Negotiations with other groups of debenture holders already have led to agreements on the same

basis, and it is probable that the assembly of the debenture holders to be held at Amsterdam also will accept the proposals made.

NEW MINERAL RAILWAY IN U.S.A.—Construction has commenced on a new single-track line to link North Creek to Lake Sanford, in northern New York. This new line will permit of the reopening and development of the titanium-bearing iron-ore mines, now owned by the National Lead Company, and is expected to add 100,000,000 tons of ore to the country's munitions production. The railway will be operated by the Delaware & Hudson Railroad, under agreement with the War Production Board and the National Lead Company.

RAILWAY NEWS SECTION

PERSONAL

The Minister of Production has appointed Mr. W. A. Stanier (Chief Mechanical Engineer, London Midland & Scottish Railway), Dr. T. R. Merton (Treasurer of the Royal Society), and Dr. I. M. Heilbron (Professor of Organic Chemistry, Imperial College of Science & Technology) to his staff in the capacity of full-time Scientific Advisers. The official statement issued in connection with the appointments is given on page 259.

Mr. Andrew K. McCosh, who is a Director of the London & North Eastern Railway Company, has been appointed a member of the Regional Coal Board for Scotland, Ministry of Fuel & Power. In order to devote himself to his new duties, Mr. McCosh has resigned from his position as Deputy-Controller, Raw Materials, Iron & Steel Control, but will remain at the latter's disposal for consultation.

Commander E. R. Micklem, who is a Director of Vickers-Armstrongs Limited, has been released by that company to become Chairman of the Armoured Fighting Vehicles Division, and of the Tank Board, Ministry of Supply.

The L.N.E.R. announces that Mr. E. K. Portman Dixon has been appointed to the newly-created post of Canteen Superintendent. He was Managing Director of Associated Restaurants from 1928 to 1931; in the latter year he was appointed Catering Systems Specialist to the Lamson Paragon Supply Co. Ltd.; and in 1938 he became a Director of Industrial Catering Limited. He joined the firm of Barkers (Contractors) Limited in 1940 as Area Manager, and became successively Provincial Catering Manager and Director; he vacates the latter post to take up his appointment with the L.N.E.R.

The Minister of War Transport has appointed Sir John Frederick Heaton to inquire into the working of the Government's road-haulage scheme.

We regret to record the death on September 1, at the age of 85, of Mr. Charles Davis, who was for many years Assistant Secretary of the South Eastern Railway Company.

We regret to record the death, at the age of 63, of Mr. George Sutherland, Chief Accountant, London & North Eastern Railway.

The Hon. F. C. Sturrock, South African Minister of Railways & Harbours, was entertained on September 4 at a luncheon given for him by the South African High Commissioner, Mr. S. F. Waterson. The guests included Lord Leathers, Minister of War Transport.

Mr. John O'Dowd, who, as recorded in our September 4 issue, has retired from the position of Traffic Manager, Great Southern Railways, Eire, is the son of the late Mr. John Dowd, formerly General Manager of the then Dublin & Meath Railway, and subsequently Assistant Manager of the former Midland Great Western Railway. Mr. O'Dowd was born in Dublin in 1881 and was educated in Goulburn, New South Wales, and in London. He entered the

Operating Assistant to the Traffic Manager and attended board meetings in the absence of the latter. He was appointed Traffic Manager in succession to Mr. Floyd, before reorganisation, on February 1 last. Mr. O'Dowd initiated successfully the "Mystery" and "All-in Day" Tours on the Great Southern Railways. In his younger days he lectured in the Rathmines (Dublin) School of Commerce on passenger-station accounts, passenger fares, and head-office working, and later lectured in the Dublin Technical School on railway economics; he is by examination a Fellow of the Corporation of Accountants. He acted for many years as a correspondent of THE RAILWAY GAZETTE.

Mr. Edward Stephen Harkness, who was a Director of the New York Central System and of the Southern Pacific Company, left estate in England valued at £128. In 1930 Mr. Harkness gave £2,000,000 to be spent for the benefit of Great Britain, and as a result the Pilgrim Trust was established.

The L.N.E.R. has appointed Area Welfare Supervisors for women staff as follows: Miss C. J. Thallon (Southern Area); Mrs. E. Klouman (North-Eastern Area); and Miss C. Hastie (Scottish Area).

Sir William J. Gick has recently joined the board of the International Paint Co. Ltd., and also of Scammell Lorries Limited.

The late Lt.-Colonel G. A. C. Webb, D.S.O., formerly Chief of Police, North-Eastern and Scottish Areas, L.N.E.R., left £10,671.

Reference to the appointment of Brigadier-General Sir Godfrey Rhodes, C.B.E., D.S.O., who had been General Manager of the Kenya & Uganda Railways & Harbours since 1928, as Director of Transportation in Persia, was made in the article on the Railways of Persia in THE RAILWAY GAZETTE of October 3, 1941. In the recently-issued report on the Kenya & Uganda Railways & Harbours for 1941, by Mr. A. E. Hamp, Acting General Manager, it is recorded that Sir Godfrey Rhodes first joined the Kenya & Uganda Railways as Chief Engineer in November, 1920, and, after serving in that capacity with distinction for nearly eight years, was appointed General Manager in August, 1928, after the death of Sir Christian Felling. As the report states, "this would have been in itself no easy task, but his responsibilities were made all the more onerous by reason of the fact that the first few years of his General Managership coincided with those years of economic depression in which East Africa suffered so severely. The manner in which Sir Godfrey Rhodes, by his energy and pertinacity, surmounted those difficulties is well known, and on his retirement he has the satisfaction of knowing that not only had the railway been able to meet all the urgent demands made on it during two years of war, but also that he has left it in a very sound financial position."



Lafayette]

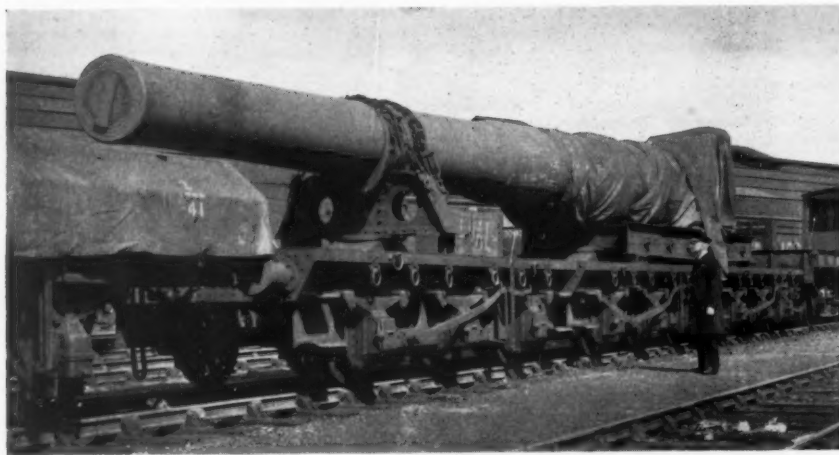
[Dublin

Mr. John O'Dowd

Who has retired from the position of Traffic Manager, Great Southern Railways, Eire

Locomotive Department of the Midland Great Western Railway in September, 1897, as a clerk, and about three years later was transferred to the Manager's Office under the late Mr. Joseph Tatlow, where he acquired a general knowledge of indoor and outdoor station working at various Dublin stations. On a reorganisation of offices he became Chief Clerk to the Superintendent of the Line and was selected specially to assist Mr. Joseph Tatlow in his inquiry into the working of the Londonderry & Lough Swilly Railway. On further reorganisation he acted as Second Assistant to the Traffic Manager. In 1925, on the amalgamation of the Irish railways, he was appointed Indoor Assistant to the Operating Superintendent, and, when the Operating and Commercial Departments were merged, he became Indoor Assistant, and later Operating Assistant, to the Traffic Manager. He was selected also, with the present Chief Engineer (Mr. Gerald Murphy), to report on the working of the Great Southern branch lines, as well as being appointed Liaison Officer between the Traffic and Road Freight Departments to co-ordinate matters concerning railhead and direct-road services which affected the Traffic Department. Later, Mr. O'Dowd was Chairman of the two Traffic Department Sectional Councils and a member of the Locomotive Council. For some years he was Chief

Railways and the War—110



Left: A load in transit on the G.W.R. which shows clearly why the public are asked to avoid unnecessary railway journeys

Right: At a Southern Railway coal depot a horse has replaced the locomotive formerly used for moving coal wagons. The horse is also used to operate a turntable



Left: Barbed wire is a considerable wartime traffic. By the spring of this year the L.M.S.R. had run more than 760 special trains to carry over 5,000,000 coils weighing 105,000 tons from one factory in the North Western area

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TRANSPORT SERVICES AND THE WAR—156

New Travel Restrictions

The Ministry of War Transport, on September 6, announced that travel by road and rail would be further restricted this winter to make room for the growing volume of military and other essential traffic and to save fuel and rubber. The restrictions apply to cheap fare tickets, visits to evacuees, travel by members of the Forces and evacuated Civil Servants, and to Green Line and other long-distance coach services.

From October 5 ordinary cheap day tickets and cheap tickets for various classes of pleasure travel will be discontinued throughout the railway system. In addition, return tickets now issued in particular districts at fares less than the monthly ticket rate will be withdrawn. Monthly return tickets will continue to be available and the limitations of distance now governing their issue in some parts of the country will be suspended. Workmen's fares and various types of concession fares to particular classes, such as blind persons and their attendants, will not be affected.

During the six winter months, October to March inclusive, parents or relatives visiting evacuated children or families will be able to obtain vouchers to travel at reduced fares for three visits only in this period instead of for one in each month. Evacuated or transferred civil staffs of Government Departments will not be allowed to make free or assisted journeys home more than twice during the winter months (October to March inclusive).

Free travel warrants for 7-days' leave in the Army and Royal Air Force will be confined to two such journeys during the winter (October to March inclusive) and special concessory fares for 48-hour leave will not be available for distances of over 50 miles. Members of Forces will be given the option of adding the period of 48-hour leave to their 7-days' leave. Free travel by members of the Civil Defence Services will also be restricted during the winter months.

The Green Line coach service of the London Passenger Transport Board is being withdrawn after Tuesday, September 29. It will be replaced where necessary by the strengthening or extension of existing bus services to act as feeders to and from convenient railway stations or other interchange points. Details of these arrangements will shortly be announced by the board. Other long-distance coach services, including the few still running into London from outside, will be discontinued, except that portions of the routes may be retained where necessary to serve rural areas which would otherwise be isolated.

Alexandra Palace Line

To conserve motive power and fuel, the L.N.E.R. is operating passenger services between Finsbury Park and Alexandra Palace during business hours only as from September 7.

Harvest Transport

The Ministry of War Transport has announced that motor-vehicle insurers have agreed to arrangements for providing insurance for the carriage of farm workers on motor goods vehicles used for the corn harvest of 1942. Existing policies of motor-goods vehicles normally cover the legal liability of the owner and driver towards passengers, but in view of the fact that some vehicles may be used for carriage of passengers for hire or reward and of the

probability that some of the farm workers will not be under contract of employment, the haulier should protect himself by covering his liability. Cover will normally be 10s. a vehicle for not exceeding two months, plus 5s. a month thereafter.

Lights on Bus Platforms

The Ministry of Home Security has been concerned at the number of accidents to persons alighting from public service vehicles during the hours of darkness, and has modified the lighting restriction order so that more light may be used during blackout on platforms of buses and so forth.

Less Light in Tube Trains

The London Passenger Transport Board has already effected a considerable saving in electricity by reducing the lighting on stations and escalators and in Underground trains. It has now announced that where possible, the lighting in trains is to be brought down to one-third of the pre-war standard, which should result in a further saving of 600 tons of coal a year above the 4,000 tons saved by earlier economies.

Government Control of Canals

Under the Canal Control (No. 2) Order, 1942, dated August 1, 1942 (S.R. & O. 1942, No. 1658), the Minister of War Transport has taken control of the undertakings or portions of undertakings in Great Britain wholly owned by, leased to or operated by the Anderton Co. Ltd., Direct Delivery Service Limited, Furley & Co. Ltd., John Hunt & Sons (Leeds) Ltd., the Mersey, Weaver & Ship Canal Carrying Co. Ltd., H. Oldridge & Son, Ernest Thomas, and Trent Carriers Limited.

The first Canal Control Order came into force on July 1, and details of it were given in our July 24 issue (page 89).

R.A.F. Attacks on Transport in Europe

The Minister for Air, Sir Archibald Sinclair, in a broadcast to Europe on September 2, explained the importance of transport in the war machine, and called on his listeners to assist the Royal Air Force in its efforts to disorganise German communications. He said that the R.A.F. was attacking the German lines of communication in the West, as the Russians were in the East. Partisans were busy behind every front in Europe. The war in the East had increased the German transport needs by more than 20 per cent. R.A.F. fighters were destroying locomotives and rolling stock in Northern France and Belgium every day. Destruction of one train or station in France produced results on the Russian front; it forced the relay of trains on other railway networks already overstrained. The object of recent R.A.F. attacks was to stop German war materials reaching the fronts. Among the important railway junctions which had been recent targets were Cologne, Duisburg, Dusseldorf, and Saarbrücken.

Curtailment of French Train Services

The French National Railways decided early in August further to curtail train services. This step is attributed to shortage of goods vehicles and coaching stock. The use of a number of trains will be restricted on certain days to passengers who are in possession of special "admission tickets" in addition to normal tickets.

German Trade Exhibitions and Travel

According to a communiqué issued by the German Trade Exhibitions & Fairs Committee, all travel facilities accorded by the German railways in connection with trips



THEIR JOURNEY IS NECESSARY

The American Expeditionary Force is a new priority demand on transport in Britain, so passenger travel must be reduced still further.

Before you travel, ask yourself whether your journey is more necessary than those of the many thousands of American Troops and their equipment now arriving in Britain.

DO NOT TRAVEL

RAILWAY EXECUTIVE COMMITTEE

A poster recently issued to impress on the public the need to avoid unnecessary travel

to and from foreign exhibitions or trade fairs have been discontinued for the duration. Among the non-German trade fairs still held in Continental Europe are the Lyons, Paris, Utrecht, Malmö, Milan, Budapest, Basle, and Lausanne fairs. All trade fairs and exhibitions in Germany were suspended last February, including the Leipzig fair due to be held in March, preparations for which were already in an advanced stage.

Plans for Finnish Line Postponed

It is stated that the project for a new railway line between the Saimaa Lake and Kotka, the port on the Finnish southern coast midway between Helsinki and Viipuri, which was discussed after the cession of Viipuri and the Karelian Province to the Soviet Union in 1940, has been set aside for the time being. The line (Davidstad-Metsäkyli-Tavastila), 56 km. (35 miles) long, was to have joined the Kotka-Kuopio line at Tavastila, and would have cost about 95,000,000 Finnish marks. It was to have replaced the Saimaa Canal (mentioned in our August 7 issue, page 124) which, by virtue of the above-mentioned cession, had come to be partly in Soviet territory, and which was particularly important for the conveyance of timber from Central Finland to the sea.

Suspension of Private Motor Traffic in Croatia

According to an announcement issued by the Croat Department of Public Order & Security on August 13, all private motor traffic in the country is to be discontinued. This measure is announced officially to be of a "temporary character"; it became effective on August 25. It does not concern diplomats accredited at Zagreb, nor traffic of the Armed Forces, nor any persons holding special authorisations to operate motor vehicles.

Narrow-Gauge Railway in Yugoslavia

A narrow-gauge railway of 50-km. (30 miles) is to be built from Kačanik Station, 36 km. (22 miles) to the north of Skopje (in Southern Yugoslavia), on the main-line

ot Nish and Belgrade, leading along the River Lepenac in a westerly direction to Strpce, in the Uroševac district. The line is intended to facilitate the conveyance of chrome ore worked mainly at the Jezerina mine near Strpce. The district contains some of the best chrome ore mined in Yugoslavia. It lies in the Bulgarian-occupied region of Yugoslavia.

Resumption of Passenger Services on Sarajevo-Dubrovnik Line

An announcement by the central management of the Croatian State Railways, issued on August 11, says that passenger-train services have been resumed on the 194-mile Sarajevo-Dubrovnik line. These had been suspended when Yugoslav patriots, fighting the Axis invaders were successful in blowing up the line at several points. There still exists a break at one point where passengers are compelled to change trains, and this prevents goods traffic from being resumed. The greatest destruction is said to have been wrought by patriots near Konjic, 47 miles to the south of Sarajevo, on a particularly vulnerable section of the line, with narrow curves and sharp gradients on which trains are worked for several miles by cog-wheel locomotives.

Increased Traffic in Hungary

According to a report from Hungary, the Royal Hungarian State Railways recorded a considerable increase in traffic and receipts during the first six months of the current year. Passenger and goods receipts are said to exceed by from 20 to 25 per cent. the level attained in the corresponding period of 1941. The Yugoslav region now in Hungarian occupation (roughly between Subotica and Belgrade and between the Danube and the Tisa) accounts for no less than from 8 to 10 per cent. of this development.

Railway Damage in Roumanian-Occupied Territory

A report from Bucharest states that the railway system of Roumanian-occupied Northern Bucovina and Bessarabia has been restored almost to normal conditions very quickly since fighting ceased in those regions. Damage to railway property in both regions combined was valued at 2,300,000,000 lei. As the result of the gradual completion of repairs, the route length of the railway system under Roumanian control (in Roumania proper and in the Roumanian-occupied regions) increased from 7,608 km. (4,725 miles) in June, 1941, to 8,161 km. (5,068 miles) in August, 1941; to 8,898 km. (5,526 miles) in September, 1941; and to 9,181 km. (5,702 miles) in December, 1941.

New Railway in the Middle East

It is reported that the line from Haifa to Beirut, referred to in our February 27 issue, has been opened throughout for traffic. Construction has been carried out largely by army engineers, including South African tunnelling companies and South African and Australian railway-construction companies.

Railways in Trans-Nistral

Some details concerning the railways in the Trans-Nistral territory were given on page 618 of our May 29 issue. An agreement has been concluded recently between the Roumanian State Railways and the Trans-Nistrian Civil Government, in accordance with which the former took over the entire railway system of the latter. The agreement provides for the operation of the services with locomotives and rolling

stock owned or hired by the Roumanian State Railways, which are to be indemnified by the Trans-Nistrian authorities in respect of motive power; the provisions of the International Railway Vehicle Convention will be applied in connection with the use of rolling stock. Rates and fares are to be fixed in accordance with a special agreement to be concluded on the basis of those in force in Roumania. All agreements in respect of Trans-Nistrian and foreign railways are to be concluded exclusively by the Roumanian State Railways. Railway personnel, both Roumanian and local (Trans-Nistrian) are placed under the supervision of the Trans-Nistrian Civil Government. Special accounts are to be kept by the Roumanian State Railways in respect of the Trans-Nistrian railways, as the budgets of the two systems are to be kept separate. Instructions for the operation of the services are issued by the central management of the Roumanian State Railways at Bucharest.

Uruguayan Railway Precautions

Employees of the Central Uruguay Railway Co. of Monte Video Ltd., one of the British-owned railways, have volunteered to guard lines and buildings during the night as a special precaution against sabotage.

Supply Routes to China

With Myitkyina, northernmost town in Burma, in Japanese hands all land routes from India and the West to Western China are effectively cut. About six months ago a road was opened from Imphal and Manipur in Assam, through Kalewa—the scene of so much recent fighting—to Yeu, the railhead of a branch of the Burma Railways connecting with Monywa, on the Middle Chindwin, and Mandalay. It was by this road that many thousands of refugees escaped from Burma into India. This, like the tracks further north from Ledo or Sadiya in Assam, through the Hukawng Valley towards Myitkyina is, however, now blocked by Japanese troops, and the fact that Myitkyina air field is in their hands precludes its use by British or American planes. This air field has been frequently bombed by us as it is a thorn in our side, and the only alternative route across northern Burma is by non-stop plane from Sadiya to Kunming, capital of Yunnan Province, a distance of about 500 miles.

There has been no recent news to indicate the progress on the Assam-China Road from Sadiya (Saikoa Ghat) to Rima, Batang, and Chengtu, the construction of which is undoubtedly being pressed forward with almost superhuman effort by the Chinese. The terrain traversed by this road is, however, extremely difficult—more difficult than most of the Burma Road. In one stretch of about 150 miles as the crow flies, four great rivers have to be negotiated, the headwaters of the Irrawaddy, the Salween, the Mekong, and the Yangtze, and between them intervene fearsome mountain ranges. A saw-tooth profile is, therefore, inevitable, and for hundreds of miles precipitous hillsides alternating with the crossings of deep ravines are unavoidable. No wonder, then, that roadmaking in such country is slow and hazardous, and to any other nation than the Chinese the completion of such a task against time would seem heartbreaking. Yet, assuming that the epic of the Burma Road construction is being repeated, and despite the sparest of population and lack of mechanical appliances, thousands of men and women and many children also are toiling like

ants to secure for their country yet another channel by which her vital munitions and other supplies may be imported.

Saikoa Ghat on the bank of the Brahmaputra opposite Sadiya, from which runs this road of the future, is connected with the main-line railway system of India, first by the Dibru-Sadiya Railway and then by the old Assam-Bengal section of the newly-formed Bengal & Assam Railway, owned and worked by the State. Physically, these metre-gauge sections in Assam are still isolated from the remainder of the railway system, but a wagon ferry across the Brahmaputra near Ganhati, connecting Pandu on the south bank with Amingaon—the railhead of the old Eastern Bengal Railway—on the north, provides the necessary link by which through goods traffic can be transported without break of bulk. As this section of the former E.B.R. is also of metre gauge, one transshipment is necessary in the carriage of supplies from the 5 ft. 6 in. gauge system of India, but otherwise through running is possible to Saikoa from Calcutta, Bombay, or Karachi, or from the industrial centres of India. It is also practically certain that at least a substantial length of the new road eastwards from Sadiya is already open for motor transport, and that the indefatigable Chinese will get some sort of a road pushed through the remaining distance before long.

A.R.P. on Western Australian Government Railways

Mr. J. A. Ellis, Commissioner of Railways, Western Australia, recently gave details of the measures being adopted for the protection of staff, passengers, and property in the event of air raids. He said that trench shelters had been constructed at important points, and that such suitable accommodation as locomotive-repair pits, supplemented by slit trenches, also would be used. These shelters provide only for staff, as they cannot also accommodate passengers, who are advised to seek ordinary shelters off railway premises. Suburban trains in motion will proceed to the next station, in the event of an air raid, and will remain there until the "raiders passed" message is received. Measures have been taken to reduce risks from flying glass, and mirrors and glass-faced advertisements have been removed from stations and compartments. Other precautions include reduced lighting in carriages, the sandbagging of important points, and the dispersal of rolling stock. Railway officers have been detailed to concentrate on A.R.P. work; and a voluntary railway A.R.P. organisation, formed in conjunction with the Civil Defence Council, has been operating for some time and has caused many fire-fighting and first-aid squads to be trained; its members have attained a high standard of efficiency.

Perth Tramways A.R.P. Measures

Instructions have been issued to the staff of the Perth Tramways on the action to be taken in the event of an air raid. Should a raid occur, drivers of trams and buses from the city will proceed to termini, unload passengers, and remain there until the "raiders passed" message is received. Inward-bound trams and buses will stop at stated points outside the city; vehicles will be spaced at intervals of not less than 400 yd., and responsible officers will be posted to give instructions to tram and bus crews as occasion demands. Moving vehicles must keep a distance of 150 yd. apart. Trams, trolleybuses, and buses are operating with masked headlights and reduced interior lighting, conforming with blackout conditions.

Scientific Advisers to the Minister of Production

The following official statement was issued in connection with the appointment of three Scientific Advisers to the Minister of Production (recorded on page 255):—

"The field of activity of these advisers will be co-extensive with the responsibility of the Minister of Production. They will keep in close touch with the scientific advisers of the service and supply departments, and will be available to assist the departmental organisations of scientific research and technical development. They will not supersede the departmental organisations, which will, for instance, continue to be responsible for the examination of new inventions and technical suggestions in their own fields. They will be responsible to the Minister of Production, but will work under the immediate supervision of the Lord Privy Seal, acting on his behalf.

These appointments have been made with a view to completing the existing organisation for scientific research and development which has been carefully built up over a number of years and operated with outstanding efficiency.

The Government has reviewed the whole position in the light of recent representations, and has decided that the creation of the post of Minister of Production affords the opportunity for this further measure of co-ordination which the Government believes will be to the national advantage."

Brazilian Railway Construction in 1941

During the last few years the Government, headed by President Getúlio Vargas, has paid special attention to all questions of transport, particularly those relating to the extension and re-equipment of railways. Obeying a plan carefully elaborated by the Ministry of Transport, the year 1941 was one of important realisations, despite the limited financial resources at the disposal of the Government, and the exceptional situation created by the war.

On Estrada de Ferro São Luiz—Therezina, a bridge was completed over the River Paraíba, and further improvements were carried out to facilitate the transport of babassú. This railway is to be extended to Barra de Berenga to join the trunk lines, which then will provide through communication to the railways of the north-east and south. On Rêde de Vição Cearense, junction of the two main lines almost was established by the branch line between Fortaleza and Sobral which had neared completion. The section of this line between Riacho de Sela and Itapipoca was inaugurated, thus giving access to the new port of Fortaleza. The extreme part of Rêde de Vição Cearense runs through Parahyban territory, where a new extension from Souza to Pombal has been opened and a further extension to Patos has been initiated with the object of affording through communication from the extreme north to the capitals of the north-east, via Campina Grande.

The Great Western of Brazil Railway opened a new section from Souza Filho to Alagoa de Baixo, and began work on a further extension of 70 km. of line to Afogados de Ingazeiros, in the direction of Flores. In the south, joining with Vição Ferrea Federal Leste Brasileiro, yet another extension was inaugurated between Annum and Palmeira dos Índios. On the latter railway, track was laid be-

tween Afogados and Guaranhem, thus giving contact between the Joazeiro and Propriá lines and those of the Central of Bahia. Construction was continued on a line connecting the Leste Brasileiro with the São Luiz—Therezina, and the section between Mafrense and Paulista was opened for traffic. A new line between Patrocinio and Monte Carmello was completed on Rêde Mineira de Vição, and earthworks were laid as far as Ouidor. In addition, a new line was constructed between Mello Viana and Barra do Funchal, and electrification between Pestana and Andradina completed.

Estrada de Ferro Noroeste do Brasil is in many respects one of the most important systems in the country, from the point of view that it serves the valleys of the rivers Paraná and Paraguay. When this railway first was built the alignment followed the valley of the river Tieté, beyond Araçatuba, to the State of Paraná, but the unhealthy nature of the valley did not permit of settlements being established. Consequently, a new location was decided on over the higher country extending between the Tieté and Aguapei, and some 130 km. of line already are completed. The raising of the line in Matto Grosso, where in many places it was subject to inundation from the river Paraguay, also was undertaken, and a bridge is being built over that river. This bridge, 1,995 m. in length, is the largest so far attempted in South America, and it will allow of rail extension from Porto Esperança to Corumbá. On Rêde de Vição Ferrea Paraná—Santa Catharina, a new line between Jacarezinha and Marques dos Reis was completed, giving connection with the São Paulo-Paraná Railway. A further extension between Barra Bonita and Arthur Bernardes, and some 40 km. of the new Guarapuava branch also was completed.

The following new sections were opened for traffic: (1) from Schnoor to Alfredo Garça, on Estrada de Ferro Bahia e Minas; (2) from Lages to Angicos, on the Estrada de Ferro Rio Grande do Norte; (3) from Caraubas to Almino Afonso, on the Estrada de Ferro Mossoró; and (4) from Piracururuca to Periperi, on the Estrada de Ferro Central do Piahy.

Staff and Labour Matters

Payment for Fogging and Snowstorm Duties

A decision (No. 20) has been issued recently by the Chairman of the Railway Staff National Tribunal on a claim by the National Union of Railwaymen that "men specially called for immediate duty for fogging or snowstorm duties on weekdays or Sundays shall receive payment from time of call." The conditions under which fogging and snowstorm duties are at present performed are governed by the "fogging, snowstorm, and emergency and special duties" agreement which has been operative since the first full pay week in December, 1928. This agreement provides for enhanced payment for staff while actually performing the duties which it covers. It makes no provision for payment to commence from the time of call.

The contentions of the parties were set out in detail in a joint case submitted to the Chairman. In substance the union contended that the circumstances in which men are required to undertake fogging and snowstorm duties, their liability to be called out at any time, but more usually in the night or early morning hours, when the booking on point or place of duty is not always easy of access and transport may prove difficult; discomfort and broken rest, justify the present claim. Further, the union stated that subsequent to December, 1928, it was the practice of the London Midland & Scottish and the Southern Railway Companies to pay from the time of call, signal and telegraph men and permanent way men in certain areas when such men were required for emergency duties under the "fogging, snowstorm, and emergency, and special duties" agreement.

It was contended on behalf of the companies that the position as it exists today differs in no material way from that which existed when the "fogging, snowstorm, and emergency, and special duties" agreement was originally negotiated and that the claim now made seeks not only to differentiate between classes similarly provided for under that agreement, but would cut directly across the principle, generally applicable throughout the railway service,



A signal box on the L.M.S.R. was recently moved 220 yards in 57 minutes by a mobile crane. The change of site was necessary because of a new loop line laid to speed the movement of war traffic

to make payment only from the time of reporting for duty, from which time alone the companies have control over their workmen.

As to the union's statement that upon occasion in the past signal and telegraph men and permanent way men in certain areas were at one time paid from the time of call when called for emergency and special duties, the companies pointed out that such a practice where it did exist was never of general application and they contend that none of the grounds advanced by the union affords a justification for the claim now made.

The Chairman finds against the claim.

L.P.T.B. Stationery Economy

Apart from the large savings in paper consumption which have been effected by the London Passenger Transport Board by the reduction in size of posters, tickets, and other items, considerable economy has been effected in the sphere of stationery and printed forms alone. The board has, as part of its permanent organisation, a section responsible for reviewing each application for the introduction of a form or for the reprinting of an existing one; it is authorised to inquire into procedure in respect of forms and to put forward suggestions for improvement, and efficiency and economy were sought continually in peacetime.

The work of the forms section was thus of material assistance when a shortage of paper was threatened, and steps were taken immediately to curtail the use of forms, to reduce the size and quality of paper wherever possible, and to draw the attention of the staff to the need for

economy. Nearly half the forms in use in peacetime now have been eliminated or reduced in size, and the consumption of paper used for forms is only half that of pre-war days; the weight of paper so saved is estimated at some 120 tons a year. Among outstanding examples which have contributed to this figure are the saving of 12 tons and 10 tons a year by reducing the size of conductors' cash-total sheets and log cards respectively, and of nearly 4 tons by supplying letter paper in reduced sizes. Each type now is designed for folding and sealing, to obviate the use of envelopes.

Before the war, envelopes were used also for internal correspondence in many cases; this practice has been abolished, partly by the use of small paper seals as used also for external letters, and partly by the introduction of folders made from scrap material (rexine, linen, and canvas) which can be used over and over again. In all cases where envelopes still are used, economy labels are employed where possible.

Fuel Problems in Argentina

The growing scarcity of fuel, due to the restricted importation of coal and petroleum, continues to be the cause of the gravest concern to the Argentine railways. In view of the seriousness of the situation and to safeguard existing fuel stocks, the Government was compelled to adopt a modified form of rationing (described in a special article published in THE RAILWAY GAZETTE of December 19 & 26, 1941), under which the coal consumption by the railways has been reduced by 70 per cent. and oil consumption to 85 per cent. of the 1940 total. Similar restrictions have been imposed on the electric light and power, gas, and other industrial concerns.

Experiments by the railways with a

mixture of coal and maize have given fairly satisfactory results, but the general adoption of the practice is limited by technical difficulties which were explained in our July 4, 1941, issue. The use of wood fuel is increasing, but its bulk and low calorific value make it an unsatisfactory substitute for coal, even in goods locomotives, and it is unsuited for main-line passenger trains.

At the outbreak of the war the Argentine railways, envisaging the probability of a scarcity of fuel, with the authority of the Government, suppressed or reduced a number of their subsidiary services, to enable them to maintain a more or less normal service of the more important trains. Thanks to skilful organisation on the part of the managements, the general public up to recently had experienced but little inconvenience from these modifications.

A critical and fairly exhaustive analysis of the Argentine fuel problem is contained in a report on "Fuel consumption in Argentina during the last 20 years" issued by the Instituto de Estudios Económicos del Transporte, which states that fuel consumption in Argentina during 1941 shows an increase of 9.6 per cent. over 1940, and of 11.7 per cent., as compared with 1939. The consumption of all classes of fuel in the country during 1941 amounted to 10,364,000 tons, as shown in the following table. For purposes of statistical compilation and uniformity, the different classes of fuel have been reduced to an equivalent volume of petroleum, based on their calorific value relative to that of petroleum.

Fuel Consumption in 1941		
Fuel	Equivalent in tons of petroleum	Percentage of total consumed
Petroleum ...	5,088,000	49.1
Wood ...	1,568,000	15.1
Residuary matter ...	1,407,000	13.6
Coal ...	991,000	9.6
Charcoal ...	545,000	5.2
Natural gas ...	435,000	4.2
Maize ...	330,000	3.2
Total ...	10,364,000	100.0

The above total of fuel consumption during 1941, compares with the corresponding figure on the same basis of calculation for 1922 of 5,263,000 tons, an increase of 97 per cent. Omitting fuel consumption by the railways, which has not substantially altered during the period referred to, the increase is 122 per cent.

The report states that the steadily growing demand for fuel since 1922 has been met mainly by petroleum, both national and imported. Of the increased fuel consumption since 1922 of more than 5,000,000 tons, 75 per cent. corresponds to petroleum, of which three-quarters are national. The total consumption of petroleum and its derivatives during 1941 was 5,088,000 tons, of which petrol accounted for 1,025,000 tons.

IRON AND STEEL RATIONING IN ARGENTINA.—The Argentine Government has issued a Decree providing for the rationing of all materials composed of iron and steel, and for the exercise of control over iron and steel articles in stock or to be manufactured or imported. Due to the war, the only source from which these materials can be obtained in adequate quantities is the United States; the quotas for Argentina for the first half of this year are insufficient for requirements, and excessive prices have resulted. The Decree aims at controlling prices and ensuring an adequate supply, and provides for the creation of a rationing committee of four members.



Sir Harold Hartley (Vice-President), Mr. G. L. Darbyshire (Chief Officer for Labour & Establishment), Sir William Wood (President) and Lady Wood, at the first annual allotments show, held on August 29, at the L.M.S.R. country headquarters. The show was opened by Lady Wood

Many of the staff at the L.M.S.R. country headquarters have become enthusiastic gardeners, and the management of the company has made available portions of the headquarters estate for allotments. At the show 405 entries competed for prizes valued at more than £25. Part of the produce was sold in aid of the L.M.S.R.

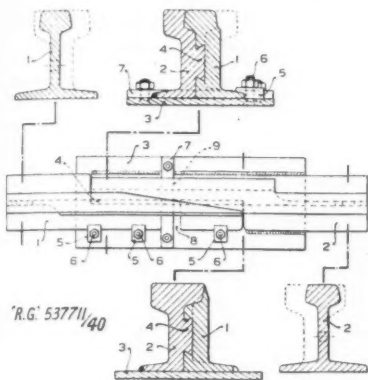
Prisoners of War Fund, and the remainder was presented to local hospitals

ABSTRACTS OF RECENT PATENTS*

No. 537,711. Rail Joints

Batavus Bernardus Cornelis Felix, of No. 9, Bilderstraat, The Hague, The Netherlands. (Application date: January 1, 1940.)

Two rail sections 1, 2, of the thick webbed type bear on a plate 3 which is welded to one section 2. The outer ends of the rails are planed off to the normal cross-section, and are shaped so that a dovetail on rail 2 engages a groove in rail 1. Bolts 6 and clips 5 engage the top face of the foot of

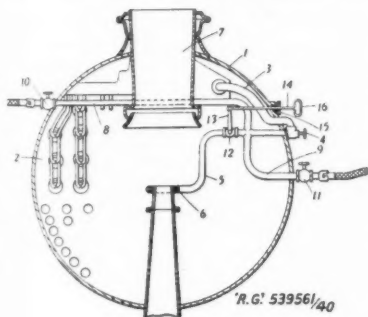


rail 1 and secure it to the bearing plate 3. The inner-end portion of rail 2 longitudinally overlaps and laterally opposes the outer face of the inner end portion of rail 1, the head of rail 1 having been shot off to normal cross-section through its entire length. Furthermore the meeting ends of the heads of both rails are bevelled, the width of rail 1 being zero when rail 2 becomes full width.—(Accepted July 3, 1941.)

No. 539,561. Draught Inducing

Dominic McNulty, of 45, Warton Terrace, Chillingham Road, Heaton, Newcastle-on-Tyne. (Application date: May 3, 1940.)

An appliance for accelerating generation of steam in a locomotive when not in steam consists of branch pipes 8 and 9 from the steam jet pipe 5, one branch pipe leading to one side of the smoke box



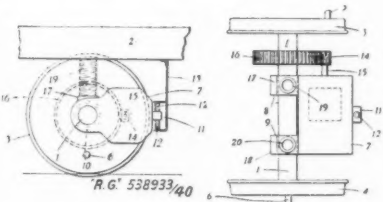
1 and one leading to the other side, and stop valves 10 and 11 are fitted in the branch pipes. The main steam pipe 3 leads from the front tube plate 2 to the usual blower valve 4 which is connected

to the steam jet pipe 5 terminating in jet ring 6 under the funnel 7. Between the point of union of branch pipes 8 and 9 with jet pipe 5, and jet ring 6 there is a jet valve 12 operated by a lever 13 with link 14, passing through a gland 15 in the smoke box casing 1, and having an external handle 16. When in use, the locomotive which is "alive" is used as a source of steam for two other "dead" locomotives. For this purpose valves 10 and 11 are connected to the corresponding connections of the two "dead" locomotives. Handle 16 is operated to close jet valve 12 in the "live" locomotive, but in the "dead" locomotives handle 16 is operated to adjust the jet valves 12 to create the necessary blast to maintain the desired steam pressure in the "live" locomotive. The blower valve 4 is then opened to pass live steam to the jet ring 6 of the "dead" locomotives. Blasts are thereby created in the "dead" locomotives and draughts induced in the furnaces, thus accelerating the combustion of the fires and the consequential production of steam.—(Accepted September 16, 1941.)

No. 538,933. Electric Locomotives

Herbert George McClean, of Willowbrook, Coombe Rise, Shenfield, Essex, and Crompton Parkinson Limited, of Guiseley, near Leeds, Yorkshire. (Application date: April 26, 1940.)

The wheels 3, 4 with coupling pins 5, 6 are mounted on a driven axle 1. Motor 7 is slung on bearings 8, 9 consisting of balls or rollers 10. The side of motor 7



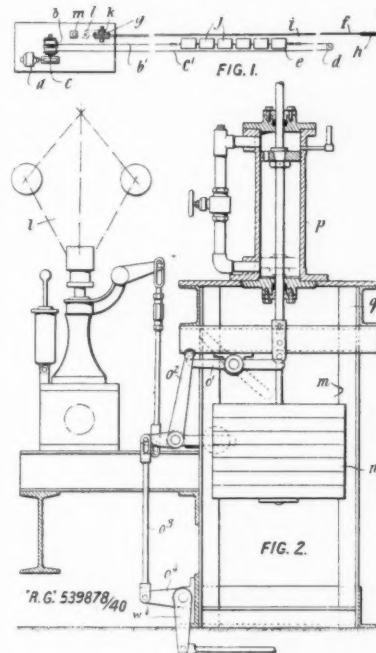
remote from axle 1 is supported by means of a lug 11 extending between springs 12 which are carried by bracket 13 secured to the main frame 2. In this way the frame 2 is partially suspended by the springs 12 and bearings 8, 9. Drive transmission from motor 7 to axle 1 comprises pinion 14 mounted on motor shaft 15 and meshing with a gear wheel 16 mounted on the axle 1. The framework of the motor includes platforms 17, 18 forming beds for the associated end of the vehicle. Thus springs 19, 20 are located on these platforms in symmetrical positions with respect to the axle 1. In some cases there may be one only of the springs, which is located to one side of axle 1; a separate and independent bearing is provided at the other end of the axle.—(Accepted August 21, 1941.)

No. 539,878. Underground Railroads

Qualter Hall & Co. Ltd., of Railway Foundry, Barnsley, Yorkshire, and John Stanfield Hayes, of "Highfield," Crofton, near Wakefield, Yorkshire. (Application dates: June 7, 1940, and June 29, 1940.)

In an underground mine haulage system there is a safety device for controlling an

overrunning and/or overspeeding arrangement, consisting of a supplementary rope or cable associated between the haulage mechanism and the train. Thus in Fig. 1 there is an endless supplementary rope *f* extending along the whole track round pulley *h* and a supplementary driven surging wheel *g*. One run *i* of rope *f* is attached at *j* to the train of tubs *e*. The tubs *e* are hauled by a main haulage rope *b'* on engine drum *b* and a tail haulage rope *c'* on engine drum *c*; the two



ropes are continuous around pulley *d*. Drums *b* and *c* are driven by engine *a*. Normally rope *f* is merely driven by the tubs *e* causing drum *g* to idle. Rope *f* is passed three or four times round drum *g*, which has brakes *k*. Geared to drum *g* is an overspeeding governor *l* which, at a predetermined speed trips a device *m* to brake the drum *g* and engine *a*. This device *m* (Fig. 2) consists of a deadweight *n* which released by levers *o*, *o*, *o*, *o*, operated by governor *l*. The fall of deadweight *n* is cushioned by an oil cylinder *p* on support *q*, and brings about application of the brakes.—(Accepted September 26, 1941.)

COMPLETE SPECIFICATIONS
ACCEPTED

538,057. Liechty, H. Locomotives.

538,073. New Conveyor Co. Ltd., and Smith, J. V. Conveyors.

538,087. Howden & Co. Ltd., J., and Nelson, W. Mechanical draught systems for boiler furnaces.

538,095. Godfrey, P. F. Machines for issuing or vending articles such as tickets, booklets, packages, or the like.

538,125. Williams, L. Wynn-. Two-way self-reversing lever mechanism for operating the points of railway switch mechanism and the like.

538,262. Sandberg, C. P., Sandberg, O. F. A., and Humfrey, J. C. W. Manufacture of railway and tramway tyres and solid wheels.

* These abridgments of recently published specifications are specially compiled for THE RAILWAY GAZETTE by permission of the Controller of His Majesty's Stationery Office. The full specifications can be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, price 1s.

Notes and News

Cammell Laird & Co. Ltd.—An interim dividend of 4 per cent. will be paid on October 3, the same as a year ago.

British Oxygen Co. Ltd.—Interim dividend of 7 per cent., less tax, on account of 1942. The same rate was paid last year.

British Rubber Publicity Association.—The branch office of the association at 1, Albert Mansions, Lansdowne Road, Croydon, is being closed as from September 4. All inquiries should be addressed to the registered office, 19, Fenchurch Street, London, E.C.3.

Japanese Locomotive and Rolling-Stock Construction.—According to a report from Tokyo, Japanese locomotive- and wagon-building companies turned out in 1941 1,210 locomotives and 8,882 wagons and coaches, of a total value of 84,600,000 yen. Locomotives and rolling stock produced in Japan in 1937 were valued at yen 14,300,000.

Henry Spurrier Memorial Fund.—The total of the Henry Spurrier Memorial Fund, to establish transport scholarships under the aegis of the Institute of Transport, has now passed £13,000. The fund remains open primarily to permit receipt of gifts from overseas. The trust deed, recently executed, will be formally handed to the Council of the Institute of Transport at a function in London on September 15.

Head, Wrightson & Co. Ltd.—Trading profit for the year to April 30, 1942, was £184,679 (£183,193). After deducting £30,000 (same) for depreciation, £126,000 (£130,000) for taxation, and providing for fees, debenture interest, etc., the net profit was £20,929 (£15,443) and £21,243 was brought in. The final ordinary dividend of 3½ per cent. again makes 6 per cent. for the year, and the sum of £27,648 is carried forward.

Canadian Pacific Railway.—Gross earnings for July, 1942, were \$21,926,000, an increase of \$2,567,000, and expenses were \$18,658,000, or \$2,494,000 higher. Net earnings at \$3,268,000 were \$73,000 more than for July, 1941. For the first seven months of 1942 gross earnings amounted to \$142,959,000, an increase of \$23,759,000, and the net earnings of \$25,216,000 were \$2,101,000 greater than for the first seven months of 1941.

Reorganisation of Spanish Railway Administration.—As a result of the administrative reorganisation of the Spanish railways a new division, Way & Works, has been established. The divisions hitherto existing, concerning the regions previously covered by the principal railway companies, have been abolished. The broad-gauge system now is subdivided into nine Construction Managements, four in Madrid, and one each at Barcelona, Leon, Malaga, and Zaragoza. Each of these managements controls from five to seven construction offices, and each in turn supervises 7 or 8 districts. Every district has been allotted ten working groups consisting of five men each.

Wrought Light Alloys Development Association.—Communications to the Secretary of this association should be addressed to the registered office, 25, Bennett's Hill, Birmingham, 2. Requests for technical advice should be addressed to the Manager (Dr. E. G. West), and for the loan of literature from the association's library to the Information Officer (Mr. T. D. Smith, B.Sc.), in each case to Union

Chambers, 63, Temple Row, Birmingham, 2. The telegraphic address is now Lightaldev. The latter change of address has been made necessary by the increase in the work of the association, the resources of which are available, without charge or obligation, to all engaged on the treatment or manipulation of wrought aluminium-alloys.

G.W.R. (Extension of Time) Order.—The Minister of War Transport has made the Great Western Railway (Extension of Time) Order, 1942 (S. R. & O., 1942, No. 1666), extending by three years the time limited by Section 40 of the Great Western Railway Act, 1937, for the completion of the railways authorised by Section 5 of that Act.

North British Locomotive Co. Ltd.—Payment is to be made on September 29 of 2½ per cent. on the 5 per cent. cumulative preference stock. In June last the directors decided to pay 4½ years' dividend arrears on this stock, thus clearing off the balance of arrears up to December 31, 1941.

L.M.S.R. using Rails from America.—Certain portions of the L.M.S.R. are now being relayed with steel rails from America. As American rails are only 39 ft. in length, compared with the British standard of 60 ft., the L.M.S.R. has welded two lengths to form 78 ft. rails, and on some sections of the main line three lengths to form 117 ft. rails.

Road Accidents in July, 1942.—The return issued by the Minister of War Transport of the number of persons reported to have died, or to have been injured, as a result of road accidents in Great Britain during the month of July last shows 465 deaths (compared with 648 in July, 1941), 2,791 seriously injured (compared with 3,772 in July, 1941), and 8,044 slightly injured (compared with 12,169 in July, 1941). In a supplementary note, the Parliamentary Secretary to the Ministry of War Transport points out that the danger of road deaths may increase, unless special care is exercised, due to the absence of normal traffic, which may cause laxity on the part of the remaining drivers and of pedestrians.

Home Railway Stock Quotations.—Changes in the order in which home railway quotations are given in the Stock Exchange Official Lists are to be introduced as soon as practicable. At present the quotations are divided into five sections, namely: ordinary shares and stocks; issues of lines leased at fixed rentals; debenture stocks; guaranteed shares and stocks; and preference shares and stocks. The new arrangement will group all these securities under the one heading of "Railways—Great Britain and Northern Ireland," and the issues will appear against the names of the different companies, joint committees, etc., beginning with the junior stocks and ending with the debenture stocks.

Institution of Mechanical Engineers Programme.—The programme of the Institution of Mechanical Engineers arranged for the first half of the coming session includes the presidential address, by Colonel S. J. Thompson, D.S.O., M.I.Mech.E., on "Boilers—Past and Present" (October 23); the Thomas Hawksley Lecture, by Lord Dudley G. Gordon, D.S.O., M.I.Mech.E., on "Recent Developments in Refrigeration" (November 6); a discussion on "The Training Activities of the Ministry of Labour," introduced by Mr. E. Watson Smyth (October 9); papers on "Caustic Embrittlement," by Mr. E. W. Colbeck, M.A., Mr. S. H. Smith, B.Sc., and Mr. L. Powell, B.Sc., and on "Corrosion of

Boiler Tubes," by Mr. T. Henry Turner, M.Sc. (November 20); papers on "The First Gas Turbine Locomotive," by Dr. Adolf Meyer, and on "A New Rotary Compressor," by Mr. A. J. R. Lysholm, M.I.Mech.E. (December 18); the Thomas Lowe Gray Lecture, by Mr. C. C. Pounder, M.I.Mech.E., on "Some Types of Propelling Machinery Available to Ship-owners" (January 8); a paper on "Practice and Experience in the Production of High-Speed Helical Gears, with special reference to the Elimination of Transmission Noises," by Mr. S. A. Couling,

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices	
			Sept. 4, 1942	Rise Fall
G.W.R.				
Cons. Ord.	43½	30½	46½	+ ½
5% Con. Pref.	109½	83½	107	—
5% Red. Pref. (1950) ..	105½	96½	105	—
4% Deb.	113½	102½	108½	—
4½% Deb.	115	105½	109½	—
4½% Deb.	121½	112	114½	—
5% Deb.	132	122	127½	—
2½% Deb.	70	62½	74	—
5% Rt. Charge	129½	116	125½	—
5% Cons. Guar.	128	110½	123	—
L.M.S.R.				
Ord.	17½	11	20½	+ ½
4% Pref. (1923)	53	33½	54	+ ½
4% Pref.	68½	48½	70	+ ½
5% Red. Pref. (1955) ..	97½	77	99½	—
4% Deb.	105½	97	104	+ ½
5% Red. Deb. (1952) ..	110½	106½	109½	—
4% Guar.	100	85½	98½	—
L.N.E.R.				
5% Pref. Ord.	3½	2½	4½	+ ½
Def. Ord.	2	1½	2½	+ ½
4% First Pref.	52½	33	53	+ ½
4% Second Pref.	19½	10	22½	+ ½
5% Red. Pref. (1955) ..	79½	52	87½	—
4% First Guar.	90½	74½	91½	—
4% Second Guar.	80½	59	82	+ ½
4% Deb.	79½	68½	79	—
4% Deb.	104	91½	102½	—
5% Red. Deb. (1947) ..	106	102½	104½	—
4½% Sinking Fund Red. Deb.	103½	99½	103½	—
SOUTHERN				
Pref. Ord.	65½	43½	66½	+ ½
Def. Ord.	15½	9	17	+ ½
5% Pref.	107	77½	105½	—
5% Red. Pref. (1964) ..	107	89½	107½	—
5% Guar. Pref.	128	111	123	—
5% Red. Guar. Pref. (1957) ..	114½	107½	110½	—
4% Deb.	112	102½	107	—
5% Deb.	130½	119	126½	—
4% Red. Deb. (1962-67) ..	108½	102	108½	—
4% Red. Deb. (1970-80) ..	108½	102½	107½	—
FORTH BRIDGE				
4% Deb.	99½	90½	105	—
4% Guar.	99	85½	103½	—
L.P.T.B.				
4½% "A"	120½	109½	114½	—
5% "A"	130½	115½	123½	—
4½% "T.F.A."	103½	99½	100	—
5% "B"	117	102	114½	—
"C"	46½	28½	47	+ ½
MERSEY				
Ord.	24½	19½	22	—
4% Perp. Deb.	100	90	99	—
3% Perp. Deb.	73½	63	77	—
3% Perp. Pref.	58	51½	59	—
IRELAND				
BELFAST & C.D.				
Ord.	4	4	9	—
G. NORTHERN				
Ord.	14½	3	23½	+ ½
G. SOUTHERN				
Ord.	14½	5	15½	—
Pref.	17	10	21	—
Guar.	44	16	42	—
Deb.	61	42	64	—
£ ex dividend				

§ ex dividend

OFFICIAL NOTICES

OVERSEAS EMPLOYMENT: A Maintenance Engineer is required for the Trinidad Government Railway for three years, with possibility of permanency. Salary: \$T.2,880 rising to \$T.3,840 a year (\$T.4.80 = 11). Free passages. Candidates must be Associate Members of the Institute of Civil Engineers or hold equivalent qualifications; have been thoroughly trained in theoretical and practical engineering on a British railway; and be capable of taking charge of permanent way, works, and signalling equipment, as well as the supervision and preparation of plans, estimates, accounts, reports, etc. Written applications (no interviews), giving details of age, training, experience, and name of present employers, should be sent to The Secretary, Overseas Manpower Committee (Ref. 408), Ministry of Labour & National Service, Hanway House, Red Lion Square, London, W.C.1.

OVERSEAS EMPLOYMENT: Assistant Locomotive Superintendents are required for the Government Railways in Nigeria and Sierra Leone for the duration of the war or one tour of 12 to 24 months, whichever is the shorter period, with possibility of permanency. Salary: £475 rising to £840; commencing salary according to qualifications and experience. Separation allowance for married men is £80 on salary of £475. Free passages and quarters; free medical attention. Candidates must be Associate Members of the Institution of Mechanical Engineers or hold an equivalent qualification; have served a pupilage or full apprenticeship in the works of a British railway or firm of locomotive builders; and have had subsequent running experience. Written applications (no interviews), giving particulars of age, training, experience, and name of present employers, should be sent to The Secretary, Overseas Manpower Committee (Ref. 410), Ministry of Labour & National Service, Hanway House, Red Lion Square, London, W.C.1.

OVERSEAS EMPLOYMENT: An Assistant Mechanical Engineer is required for the Tanganyika Government Railway for one tour of 20 to 30 months, with possible permanency. Salary: £420 rising to £720. Free passages and quarters. Candidates must hold an engineering degree or equivalent qualification; have served a pupilage or full apprenticeship with a British Railway passing through all sections of the locomotive repair and building works, including Drawing Office and Running Sheds; and have had at least two years' subsequent experience. Written applications (no interviews), giving details of age, training, experience, qualifications, and name of present employers, should be sent to The Secretary, Overseas Manpower Committee (Ref. 411), Ministry of Labour & National Service, Hanway House, Red Lion Square, London, W.C.1.

A.M.I.Mech.E. (January 22); a paper on "Some Textile-Finishing Machines," by Mr. K. S. Laurie, M.A., A.M.I.Mech.E. (February 19); and informal meetings on November 13, December 11, January 15, and February 12. It is intended to hold all meetings at the Institution at 5.30 p.m.; due notice will be given if it is found necessary to alter this time.

Spanish Railway Bridge.—Reuters reports that the bridge for carrying the new Zamora-Corunna line over the River Esla in Spain, previously reported to be under construction, now has been completed. It is the largest armoured-concrete single-span bridge in existence.

Proposed Airport in Uruguay.—The Uruguayan Commission of Public Works, functioning under the direction of the Council of State, has approved a scheme for the construction of an airport at Carrasco, at a cost of 7,000,000 pesos, to be defrayed by means of an issue of Government bonds.

Paris Metro Debenture Loan.—Compagnie du C. de f. Metropolitain announces the impending issue of a 4 per cent. debenture loan of fr. 1,020,300,000, the interest service of which is to be guaranteed by the Municipality of Paris. Interest dates will be February 16 and on August 16. This loan will be redeemable either by drawing or by repurchase within 30 years as from August 16, 1942, but the company will be entitled to redeem it at any earlier date. The issue will be at 97.8 per cent. The proceeds of the loan will be applied to the conversion of the following Metro loans still outstanding: 6 per cent. loan of 1937, 5½ per cent. loan of 1939, and 5 per cent. loan of 1940. Subscriptions will be made by surrendering securities of those loans or in cash.

Ringhoffer-Tatra Works of Prague.—The report for 1941 emphasises the fact that the company's wagon works, together with those for the manufacture of motor vehicles and ploughs, were occupied fully during the year under review. To increase production, rationalisation was carried to the highest pitch, and it is stated that the works will be fully occupied also for the current year. The gross surplus for 1941 totalled Kc. 117,100,000, compared with Kc. 84,300,000 for 1940; after deduction of Kc. 7,700,000 (Kc. 6,600,000 in 1940) in respect of overhead charges, of Kc. 33,000,000 (Kc. 17,000,000) for taxation, of Kc. 33,800,000 (Kc. 25,300,000) for social welfare, and of Kc. 33,000,000 (Kc. 26,800,000) for depreciation, there resulted a net profit of Kc. 9,670,000, against Kc. 8,560,000 for the preceding year; to this the amount of Kc. 820,000 carried

forward from 1940 was added. A dividend of 6 per cent. was paid (Kc. 48 a share), as for 1940.

Weekly Concerts for Transport Workers.—On Monday, September 7, the E.N.S.A. lunchtime concert season at London Transport's rail, bus, and trolleybus overhaul depots began. The first concert was held at the bus maintenance depot, and weekly concerts will be given thereafter to 5,000 workers a week.

United States Record Machine Tool Output.—Mr. Ralph Bard, Assistant Secretary, of the United States Navy, stated recently that the United States is now manufacturing in a few days as many machine tools as were manufactured in twelve months ten years ago. It is estimated that the industry will produce more than 200,000 during the current year, which has already beaten the 1941 record output.

Development of Irish Resorts.—The Irish Government has made an initial grant of £3,100 for the development of Tramore, County of Waterford, by the Irish Tourist Board, and Tramore is the first resort to benefit by the board's scheme for development, which is to be financed by a repayable grant not exceeding £40,000. The Government has provided for the continuance of the board until March 31, 1944; the non-repayable grants up to a maximum of £9,000 in any one year, and for repayable grants to enable the board to undertake approved schemes for resort development.

International Goods Traffic Conference at Sofia.—An international conference on the organisation and smooth working of goods traffic between Bulgaria and Central Europe took place at Sofia recently. Delegates of the railways of Bulgaria, Croatia, Germany, Hungary, and Italy took part, and an agreement concerning the speedy handling of through traffic of agricultural produce between Bulgaria and Germany and Italy was reached. It was agreed that Bulgarian exports should begin with substantial consignments of tomatoes (fresh and pulped) and continue with vegetables and fruit, also fresh and pulped.

Rating of Coal Wharf at Railway Station.—The Court of Appeal has affirmed by a majority the decision of Mr. Justice Uthwatt, which was given in January last, in the case of Worthing Borough Council v. Southern Railway Company. In the first valuation roll, completed by the Railway Assessment Authority in 1934, a coal wharf belonging to the company at Worthing Station and let to a trader was entered as a "railway hereditament" and appeared as such on the Worthing Borough valuation list. The second valuation roll, governing

the quinquennial period April 1, 1936-March 31, 1941, was not completed until 1939. It was decided by the House of Lords in May, 1936, in the case of Westminster City Council v. Southern Railway Company, that certain premises let to tenants at Victoria Station were not railway hereditaments and must be separately rated. The Worthing Council accordingly made a proposal in 1937 under the Rating & Valuation Acts, to amend the valuation list in the second roll by separately assessing the coal wharf. Mr. Justice Uthwatt had decided that this proposal was rendered nugatory by Section 18 (3) of the Railways (Valuation for Rating) Act, 1930, which laid down that proposals for revision or amendment made under the Rating & Valuation Acts "shall not apply in the case of a hereditament for the time being shown in the railway valuation roll as a railway hereditament."

Austrian Locomotive Building Industry.—Wiener Lokomotivfabrik A.G., about which some details were given in our May 22 issue, returned for 1941 a gross surplus of RM. 21,960,000 in addition to extraordinary income of RM. 670,000. Interest service absorbed RM. 470,000, and extraordinary expenditure amounted to RM. 40,000; salaries and wages, social expenditure, depreciation, taxation, and other items, totalled RM. 22,120,000. The balance sheet showed balance sum of RM. 43,650,000, invested capital of RM. 18,770,000, circulating capital at RM. 24,550,000, share capital at RM. 14,000,000, debenture loan at RM. 4,000,000, and other short-term liabilities, including banking debts (RM. 1,300,000), at RM. 21,140,000.

Contracts and Tenders

The Bengal-Nagpur Railway has placed an order for cotton and linen thread with the Central Agency Limited of Glasgow.

The Egyptian State Railways have recently placed the following contracts:—

H. H. Robertson Company: Galvanised washers.

Grover & Co. Ltd.: Spring washers.
Guest, Keen & Nettlefolds Limited: Screws.
Charles Richards & Sons Ltd.: Bolts, nuts, etc.

Dunlop Rubber Co. Ltd.: I.E. gloves.
English Electric Co. Ltd.: Porcelain insulators.

British Iron & Steel Corporation: Mild steel plates; angles; mild steel channels, and special super high speed bright steel for wheel lathes.

James Mills Limited: Split taper pins.
Rivet, Bolt & Nut Co. Ltd.: Rivets.

Quasi-Arc Co. Ltd.: Electrodes.
Thomas Locker & Co. Ltd.: Steel woven wire cloth.

Richard Klinger Limited: Oil resisting jointing.
Stewarts and Lloyds Limited: Steel tubes.

Railway Stock Market

Although the volume of business in Stock Exchange markets showed only very moderate improvement, there was an upward trend in security values earlier in the week, when sentiment benefited from the more encouraging views current as to the latest war developments. In most sections, the dominating factors were the continued absence of selling, the firmness with which stocks are held, and the fact that they tend to be in very short supply. Consequently market values may respond strongly to very small improvement in demand. In some sections, yield considerations attracted buyers. The prevailing assumption is that, although from time to time markets must be expected to fluctuate to some extent in accordance with the nature of the war news, the general trend over a period is likely to be to higher levels in all classes of securities. As time proceeds, the tendency may be for home railway junior stocks to attract a good deal more attention, bearing in mind that, despite the fact that their dividend prospects until at least one year after the war are fairly clearly defined, they still offer higher yields than those obtainable on any other group of equity securities which have an active market. The demand for increased wages has not affected sentiment, because this is now, of course, a Government responsibility, and dividends depend on the fixed yearly

rental payable under the financial agreement. On the other hand, although dividends are conditioned by the latter, sentiment has tended to benefit from the assumption that, as the restrictions on civilian travel will make possible the transport of an even larger volume of war supplies, the upward trend in traffic is likely to be further accelerated during the winter months. Nevertheless, this will not affect the fixed rental payment; but the tendency in the market is to take the view that, bearing in mind the high level of traffic during the war, any post-war arrangement affecting stockholders would at least have to be based on the standard revenues under the 1921 Act. This probably explains the revival of speculative interest shown in L.N.E.R. preferred and deferred stocks. These two stocks cannot be expected to receive any payment under the existing rental agreement, and probably not more than the maintenance of last year's 2½ per cent. dividend on L.N.E.R. 4 per cent. second preference will be possible. In some quarters, however, it is contended that there is a remote chance of the dividend on the latter being raised to 2½ per cent.

Compared with a week ago, Great Western ordinary stock has risen further from 46 to 46½. Great Western 4 per cent. debentures were again 108½, and the guaranteed stock 123. Among L.M.S.R. issues the ordinary moved up from 20½ to 21, the senior preference from 70 to

70½, and the 1923 preference from 53 to 54½. L.M.S.R. 4 per cent. debentures were slightly higher at 104, but the guaranteed stock has remained at 98½ at the time of writing. There were, however, few movements among prior charges, and L.N.E.R. debentures were unchanged in price; the first guaranteed remained at 91½, but the second guaranteed improved a point to 82. L.N.E.R. first preference attracted rather more attention on yield considerations, and was 53½, compared with 53 a week ago. The second preference also showed an upward trend with a rise from 22½ to 23½; buying was based on the large yield; but there is also a certain amount of speculative attention given to this stock on talk that an improvement in the dividend to 2½ per cent. may be possible as time proceeds. L.N.E.R. deferred and preferred, to which reference has also been made above, have not fully held best prices, but are 2½ and 5 respectively at the time of writing. Southern deferred was also favoured, and has risen on balance from 16½ to 17½; the preferred further improved from 66½ to 66½. London Transport "C" stock has risen further from 47½ to 48½.

In other directions, there was very little attention given to South American and other foreign railway securities. Among debentures, fractionally lower prices ruled for Argentine Great Western 5 per cents, B.A. Great Southern 4 per cents, and B.A. Western 4 per cents.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open 1941-42	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffic to date			Shares or Stock	Prices				
			Total this year	Inc. or Dec. compared with 1941		Totals		Increase or Decrease		Highest 1941	Lowest 1941	Sept. 4, 1942	Yield % (Note)	
						This Year	Last Year							
South & Central America														
Antofagasta (Chili) & Bolivia	834	30.8.42	£ 17,370	— 5,610	35	£ 740,290	£ 646,370	+	£ 93,920	Ord. Stk.	104	3½	11	Nil
Argentine North Eastern ...	753	29.8.42	ps. 229,000	+ ps. 54,900	29	ps. 1,961,700	ps. 1,771,000	+	ps. 190,700	"	4	1	44	Nil
Bolivar ...	174	July, 1942	3,970	+ 175	29	31,401	26,867	+	4,534	6 p.c. Deb.	5	5	12½	Nil
Brazil ...	...	...	...	...	...	...	...	...	...	Bonds	8	2½	16	Nil
Buenos Ayres & Pacific	2,807	29.8.42	ps. 1,435,000	+ ps. 195,000	9	ps. 12,039,000	ps. 11,931,000	+	ps. 108,000	Ord. Stk.	72	1½	5	Nil
Buenos Ayres Great Southern	5,080	29.8.42	ps. 2,174,000	+ ps. 137,000	9	ps. 17,935,000	ps. 18,102,000	—	ps. 167,000	Ord. Stk.	104	3½	8½	Nil
Buenos Ayres Western	1,930	29.8.42	ps. 903,000	+ ps. 169,000	9	ps. 6,918,000	ps. 6,700,000	+	ps. 218,000	"	9	2½	7½	Nil
Central Argentine ...	3,700	29.8.42	ps. 2,175,500	+ ps. 263,350	9	ps. 17,587,200	ps. 15,354,450	+	ps. 2,232,750	"	8½	2½	6½	Nil
Do. ...	...	...	...	...	...	...	...	...	...	Dfd.	9½	1	3½	Nil
Cent. Uruguay of M. Video...	972	29.8.42	19,425	— 1,368	—	174,017	189,059	—	15,042	Ord. Stk.	9½	1	5½	Nil
Costa Rica ...	262	July, 1942	12,761	— 11,815	52	12,761	24,576	—	11,815	Stk.	15½	11½	13½	Nil
Dorada ...	70	June, 1942	17,669	+ 4,469	25	81,215	75,300	+	5,915	1 Mt. Db.	97	97	88½	6½
Entre Rios ...	808	29.8.42	ps. 295,400	+ ps. 48,000	9	ps. 2,471,300	ps. 2,662,100	—	ps. 190,800	Ord. Stk.	6½	½	5½	Nil
Great Western of Brazil	1,030	29.8.42	9,400	+ 1,800	9	344,000	310,800	+	33,200	Ord. Sh.	11½	1½	13	Nil
International of Cl. Amer.	794	June, 1942	\$115,937	+ 85,230	25	\$844,687	\$673,300	+	\$171,387	"	...	...	...	...
Interoceanic of Mexico	...	...	...	...	...	...	...	...	...	1st Pref.	4	6d.	4	Nil
La Guaira & Caracas ...	22½	July, 1942	6,950	— 1,080	29	44,940	43,245	+	1,695	"	...	...	...	...
Leopoldina ...	1,918	15.8.42	31,697	— 1,275	33	976,199	814,164	+	162,035	Ord. Stk.	4	½	5	Nil
Mexican ...	483	21.8.42	ps. 275,200	— ps. 24,700	8	ps. 2,243,400	ps. 2,235,800	+	7,600	"	½	½	½	Nil
Midland of Uruguay ...	319	July, 1942	11,961	— 2,549	4	11,961	14,510	—	2,549	"	...	...	...	...
Nitrate ...	382	15.8.42	5,975	— 2,718	7	115,541	77,332	+	38,209	Ord. Sh.	66½	1½	3½	3½
Paraguay Central	274	28.8.42	\$3,825,000	+ \$505,000	9	\$32,370,000	\$31,498,000	+	\$872,000	Pr. Ll. Stk.	43½	29	47½	12½
Peruvian Corporation	1,059	July, 1942	79,801	14,251	4	79,801	65,550	+	14,251	Pref.	6½	1½	14½	Nil
Salvador ...	100	June, 1942	£ 46,000	— £ 10,000	50	£ 1,005,172	£ 799,683	+	£ 205,489	"	...	...	...	...
San Paulo ...	153½	9.8.42	40,259	— 1,266	32	1,148,334	1,194,099	—	45,765	Ord. Stk.	52	24½	55	3½
Taltal ...	160	July, 1942	6,490	+ 3,310	4	6,490	3,180	+	3,310	Ord. Sh.	1	6½	1½	Nil
United of Havana ...	1,346	29.8.42	41,269	+ 23,243	9	348,766	169,759	+	179,007	Ord. Stk.	2½	½	4½	Nil
Uruguay Northern...	73	July, 1942	1,137	— 220	4	1,137	1,357	—	220	"	...	...	...	...
Canada														
Canadian National ...	23,562	31.8.42	2,257,200	+ 541,200	35	47,393,400	38,635,800	+	8,757,600	"	...	...	...	...
Canadian Pacific ...	17,049	31.8.42	1,526,400	+ 186,800	35	33,002,600	27,837,800	+	5,164,800	Ord. Stk.	13½	7½	10½	Nil
India														
Barsi Light ...	202	July, 1942	23,685	+ 8,903	17	63,285	67,635	—	4,350	"	...	...	...	...
Bengal & North Western	2,090	July, 1942	261,600	+ 5,267	18	1,080,300	1,092,128	—	11,828	Ord. Stk.	345	253	349½	5½
Bengal-Nagpur	3,267	20.5.42	298,800	+ 52,717	7	1,436,900	1,289,290	+	147,610	"	101	95½	94	4½
Madras & Southern Mahratta	2,939	30.6.42	212,550	+ 3,338	13	1,945,373	1,858,969	+	86,404	"	105½	101½	99	7½
Rohilkund & Kumaon	571	July, 1942	58,275	+ 3,099	18	234,300	272,651	—	38,351	"	342	290	351½	4½
South Indian ...	2,402	20.6.42	179,171	+ 43,616	12	1,376,295	1,113,057	+	263,238	"	100	87	94	3½
Various														
Beira ...	204	June, 1942	71,394	— 38	15	672,109	—	—	—	Pr. Sh.	1½	29½	2½	Nil
Egyptian Delta	607	10.7.42	9,878	+ 2,295	15	105,867	67,066	+	38,801	B. Deb.	68	45	37½	9½
Manila	...	...	...	...	...	...	...	...	...	Inc. Deb.	90½	86½	89½	6
Midland of W. Australia	277	June, 1942	24,804	+ 8,872	46	254,760	183,856	+	70,904	"	...	...	...	...
Nigerian ...	1,900	30.5.42	49,805	+ 6,156	9	453,619	438,613	+	34,944	"	...	...	...	...
Rhodesia ...	2,442	June, 1942	488,130	— 13	13	4,306,101	—	—	—	"	...	...	...	...
South Africa ...	13,291	4.7.42	793,090	+ 20,324	15	10,428,739	9,945,447	+	483,262	"	...	...	...	...
Victoria ...	4,774	Mar., 1942	1,339,304	+ 366,183	37	10,425,476	8,391,343	+	2,034,133	"	...	...	...	...

Note. Yields are based on the approximate current prices and are within a fraction of ½. Argentine traffic is given in pesos
 † Receipts are calculated @ 1s. 6d. to the rupee
 ‡ ex dividend